SRSQS
Quantity Surveyors (Pty) Ltd.

Igniting distinctive professional consulting Quantity Surveying, Architecture and Engineering Services

MERAFONG CITY LOCAL MUNICIPALITY

MASTER PLAN REPORT

ROADS AND STORMWATER

DATE: 16 JULY 2024

Chief Executive Officer: Mr Sandro Shikwambana | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda
Office Manager - Human Resource and Finance: Mrs Sthembile Modiba

Professional Registered Quantity Surveyors: Mr Phuluphedziso Rambuwani (Reg. No. 7250), Ms Nkagisang Pleasure Lekaba (Reg. No. 6713), Mr Eric Huebsch (Reg. No. 6830)

Professional Registered Architects: Mr Gary Rufaro Mzembe (Reg. No. PrArch53228341), Ms Lebogang Sinah Sithole (Reg. No. PrArch37141356)

Professional Registered Senior Architectural Technologist: Mr Willy Jab Maluleka (PSAT61320437)

Professional Registered Civil and Structural Engineers: Mr Nkosinathi Elvis Xulu (Reg. No. 201630186), Mr Moneri Moneri (Reg. No. 2023301543) Garikai Raymond Muswere (2021301045)

Professional Registered Electrical and Mechanical Engineers: Mr Lerotholi Joseph Theko (Reg. No. 2019300661), Mr Tsepo Eric Molelekoa (Reg. No. 2019300469)

Offices:

Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632

Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

MASTERPLAN FOR ROADS & STORMWATER

FOR

MERAFONG CITY LOCAL MUNICIPALITY

FINAL REPORT: JULY 2024

MERAFONG CITY LOCAL MUNICIPALITY

ROADS AND STORMWATER MASTER PLAN REPORT
AND
ESTIMATED COSTS ANNEXURES

PREPARED BY: SRSQS QUANTITY SURVEYORS (PTY) LTD

APPROVED AND ASSESSED BY:
MR. MARITO MABUNDA- OPERATIONS – CORPORATE DECISIONS HEAD

MR SANDRO SHIKWAMBANA: CHIEF EXECUTIVE OFFICER

FOR MONTH OF:

JULY 2024

Chief Executive Officer: Mr Sandro Shikwambana | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda
Office Manager - Human Resource and Finance: Mrs Sthembile Modiba

Professional Registered Quantity Surveyors: Mr Phuluphedziso Rambuwani (Reg. No. 7250), Ms Nkagisang Pleasure Lekaba (Reg. No. 6713), Mr Eric Huebsch (Reg. No. 6830)

Professional Registered Architects: Mr Gary Rufaro Mzembe (Reg. No. PrArch53228341), Ms Lebogang Sinah Sithole (Reg. No. PrArch37141356)

Professional Registered Senior Architectural Technologist: Mr Willy Jabu Maluleka (PSAT61320437)

Professional Registered Civil and Structural Engineers: Mr Nkosinathi Elvis Xulu (Reg. No. 201630186), Ms Moneri Moneri (Reg. No. 2023301543)

Professional Registered Electrical and Mechanical Engineers: Mr Lerotholi Joseph Theko (Reg. No. 2019300661), Mr Tsepo Eric Molelekoa (Reg. No. 2019300469)

Offices:

Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632

Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

DOCUMENT APPROVAL

Prepared by SRSQS Quantity Surveyors for Merafong City Local Municipality

	NAME	DESIGNATION	DATE	SIGNATURE
Prepared by	Tryphine Kajaridzire	Professional Civil Engineering Technologist	16 July 2024	
Checked by	Marito Mabunda	Chief Executive Officer- SRSQS	16 July 2024	

Document Change History

Revision	Date	Status
00	22 April 2024	Issued for Comments
01	09 May 2024	Issued for Comments
02	28 June 2024	Issued for Comments
03	16 July 2024	Issued for Approval

	Approval Client
Signature	
Name	
Designation	

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Table of Contents

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

LIST OF TABLES

LIST OF FIGURES

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

1.0 EXECUTIVE SUMMARY

Merafong City Local Municipality (hereafter also referred to as MCLM) as an independent road authority has a mandate to provide road infrastructure for its residents. Road authorities in South Africa have an obligation to plan, design, construct and maintain the road network, to protect the public investment in the road infrastructure, to ensure the continued functionality of the transportation system and to promote the safety of traffic on the road network. Authorities also have the obligation to provide a reliable, effective, efficient and integrated transport system that supports the sustainable economic and social development of the country.

This requirement will require strategic plans to be in place hence the need to produce this Master Plan document. A master plan can be defined as a dynamic long-term planning document for a municipality that provides a conceptual layout to address future growth and development for infrastructure projects. Master planning is about making the connection between buildings, social settings, and their surrounding environments. Every municipality has a mandate to provide its residence with the minimum service delivery at any point. However to achieve this there is need to be aware of the type of services required and knowledge of the current condition of the infrastructure is important.

The Master Plan will also feed into the vision of the Municipality in order to target key areas that have been ear marked for economic development. The Municipality has identified a number of developmental projects that will enhance the growth of the various town in Merafong. These project will improve the level of service of the towns including creation of employment. Each economic development project will need to be supported by a good infrastructure system. Roads are key and it is critical that each of the economic hubs should be easily accessible. A good road network will attract more people to the Hub and enhance the growth of the town. In the same case non-motorised transport should be considered for every community.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

The master plan document will assist the municipality to prioritize the infrastructure projects in relation to the targeted economic development projects and current conditions of the infrastructure. This documentation will assist Merafong to be aware of the quantities of infrastructure in relation to roads and stormwater that need urgent attention. Equipped with such information and estimate cost the municipality will be able to allocate budgets for priority projects accordingly. It can also be used by the municipality to seek for funding well in advance for a planned infrastructure projects.

Roads are the foundation of a municipality's transportation systems as they not only convey private vehicles and freight/goods, but also form the primary basis for the public transport networks in the municipality (which are mostly road going buses and taxi services). Roads play a significant role in economic development. Effective infrastructure is considered to be a key precondition for national economic growth. By investing in such infrastructure, the cost of transport and communications can be reduced, thereby facilitating trade and creating wealth. Roads are known to be an enabler of growth and a guarantor of national integration, both linking internally and externally with the global economy (DOT, 2006 (RISFSA)). The functional classification system is precisely aimed at ensuring that the road infrastructure effectively serves these needs through providing the required levels of mobility and access. Appropriate access management assures that roads can indeed play their role in the country's economy.

Merafong City Local Municipality had set out plans for road and stormwater requirements as indicated in the 2023/2024 Integrated Development Plan (IDP) as indicated below.

1. **Community Priorities 2023 – 2024 KPA 1: Basic Service Delivery**

Priority/Need	Wards Affected	Percentage planned for 2023/2024
Roads: Access of tarred/paved roads to formal areas	1,3,4,5,6,7,8,9,10,12,13,15,20,22, 23, 24,25,26,27	68%
Grading of gravel roads in formal & informal areas	1,2,3,4,5,6,7,8,9,10,12,13,15,22,2 3, 24,25,26,27	68%

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Repair of potholes in municipal tarred roads	1,3,4,6,7,8,9,10,11,12,13,14,15,16,17, 18,20,21,22,23,24,25,26,27,28	89%
Installation of speed humps	1,4,7,8,9,10,11,12,13,15,16,17,18,20, 21,22,23,24,25,26,27,28	79%
Stormwater: **Formal Areas –** functioning of stormwater drainage system	1,3,4,6,7,8,9,12,13,15,16,17,18,19,20, 21,22,23,24,25,26,27,28	82%
Maintenance of kerb inlets	1,3,4,6,7,8,9,10,11,12,13,15,16,17,18, 20,21,22,23,24,25,26,27,28	86%
Maintenance of stormwater drainage system	1,2,3,4,6,7,8,9,10,11,13,15,16,17,18 ,19,20,21,22,23,24,25,26,27,28	89%

It is very much possible that this has not yet been achieved as planned. This is concluded based on the recent visual inspections that were done in the month of March and April 2024. Physical, financial and community constraints in many areas make it unfeasible or even undesirable to build or expand roads to alleviate congestion.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

2.0 INTRODUCTION

2.1 Appointment / Terms of Reference

SRSQS (Pty) Ltd was appointed by Merafong City Local Municipality (MCLM) for the development of a Roads and Stormwater Master Plan.

Infrastructure master planning can be described as follows (The Village of Lions Bay, 2024):

- A comprehensive study that reviews a community's water supply, sanity disposal, stormwater management, roadways, and bridge infrastructure.
- a process that confirms, assesses, and estimates the condition of the community's current infrastructure inventory in terms of water, sewer, drainage, roads, and bridge infrastructure assets
- a process that identifies shortcomings that influence the immediate, medium-term, and long-term functionality of these assets
- a process that establishes and recommends future capital improvement along with strategic priorities that relate to infrastructure planning
- a process that assists in defining future budget trends as well as forms the basis of preparing an accurate 5-year financial capital plan and beyond
- a process that facilitates borrowing in the long term and facilitates grant funding opportunities
- A process which enables the municipality to prepare an asset management plan.

The assumption is made that this is the first generation of a Roads and Stormwater Master Plan for the municipality as there has not been any record of previous reports found.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

2.2 Background Information

Roads significantly affect the economic vitality and competitiveness of a municipality, as they facilitate the movement of goods and services, emergency response services and people using public transit, private vehicles, taxis, bicycles and other non-motorized transport modes. Merafong City is growing and developing and it is inevitable that congestion levels will increase, particularly during peak periods.

MCLM is categorized as a Category B municipality and is situated within the West Rand District in the Gauteng Province (Municipalities of South Africa, 2024). The municipality is situated approximately 65km from Johannesburg and is the largest of three municipalities in the district, which makes up approximately half of its geographical area. The municipality is serviced by various major roads, comprising the N12 from Johannesburg to Cape Town as well as the N14 which is the primary road between Gauteng and Mahikeng (previously Mafikeng) via Ventersdorp (Municipalities of South Africa, 2024).

Merafong City's historical development is closely knit with the discovery of rich gold deposits in the early 1930s. Fochville is the oldest town in the region and was declared a town in 1951. The town of Carletonville was named after Guy Carleton Jones, an engineer from the Gold Fields Ltd mining company, who played a prominent role in the discovery of the West Wits gold field, of which Carletonville forms a part. The mining company decided, in November 1946, to establish the town. Carletonville was proclaimed in 1948 and attained Town Council Status on 1 July 1959 (Municipalities of South Africa, 2024).

MCLM has an area of approximately 1 630km² with the following main economic sectors:

- Mining (50.7%),
- Trade (9.7%),

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

- Finance and business services (9.9%),
- Community services (9.2%),
- General government (9.1%) (Municipalities of South Africa, 2024).

2.3 Locality Map

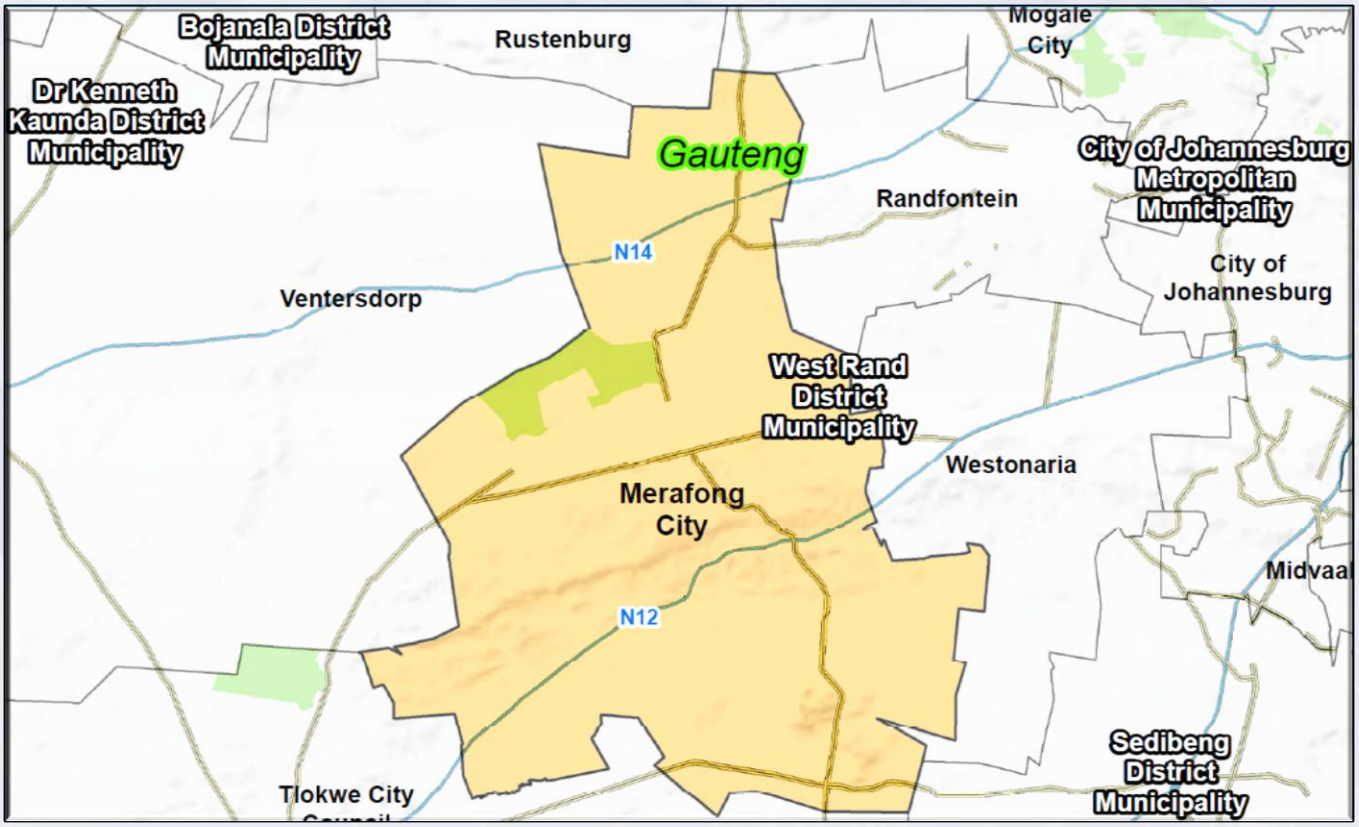


Figure 1: Locality plan of Merafong City Local Municipality (Municipalities of South Africa, 2024)

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Figure 2: Locality of Merafong City Local Municipality in relation to Gauteng Province

According to the Human Settlement Plan 2024 /25 document received from the Human Settlement department, Merafong City is characterized by a number of settlements scattered throughout the Municipal Area. This scattered settlement pattern is largely due to mining activities concentrated along the mining belt running through the centre of the Municipal Area. The primary settlements within the Municipal Area can therefore be divided into 3 sub-regions, being the northern conurbation, mining belt, and southern conurbation.

The northern conurbation consists of:

Carletonville, Oberholzer,

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Khutsong, Blybank.
Welverdiend

The southern conurbation consists of:

Fochville, Greenspark,
Kokosi Wedela.

The following mining villages are located within the mining belt:

West Wits, Deelkraal,
East & West Driefontein, Blyvooruitzicht,
Elandsridge, Doornfontein.
Elandsland,

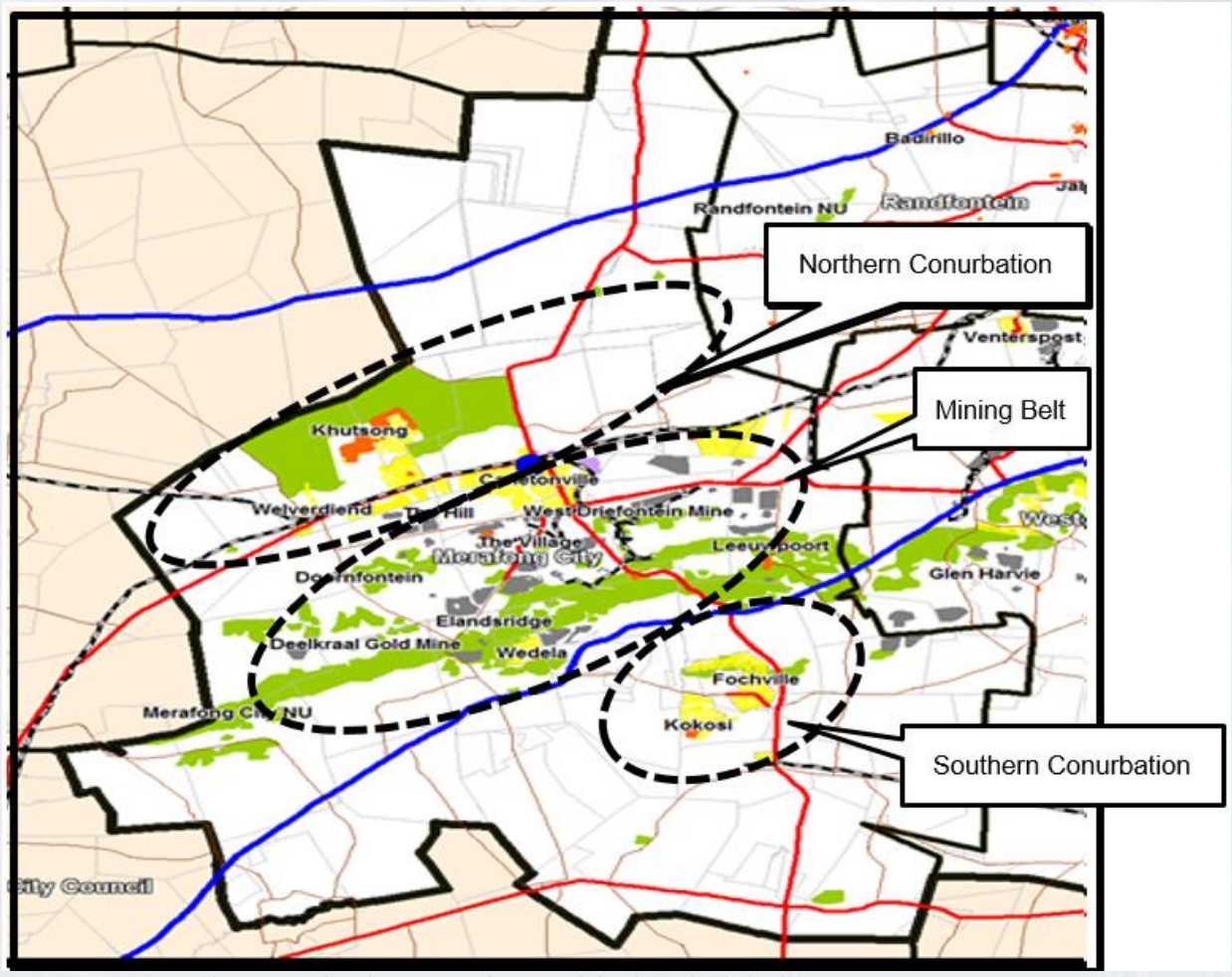


Figure 3: primary settlements within the Municipal area and the three divided sub-regions.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

3.0 PURPOSE OF THE REPORT

3.1 Background

The road network within the Merafong City LM area of jurisdiction consists of national, provincial, district and local municipal roads. The responsibility for the vast majority of urban roads and streets (some of which are unsurfaced) rests with Merafong City LM.

3.2 Objectives of the Master Plan

The objectives of the Roads Master Plan are summarized as follows:

- an evaluation of the status quo of the current conditions of the roads;
- aligning the roads and stormwater infrastructure to the vision of MCLM
- aligning the master plan to the economic development projects
- identifying key economic development projects which would require the upgrading or improvement of infrastructure in the affected areas
- identifying ongoing and planned infrastructure projects within MCLM
- Identify the gap between the current status of roads infrastructure (i.e. the existing road network in MCLM) and the planned road network;
- recommendations based on engineering principles regarding any rehabilitation, reconstruction, and/or improvement/maintenance
- Identify and detail proposed road infrastructure upgrading projects that will address shortcomings in the existing road network;
- Establish criteria for the evaluation of the priority of proposed road upgrading projects
- Establish a recommended roll-out program to aid MCLM in engaging other arms of Government in terms of where road infrastructure upgrading is urgently required.
- an estimation of the costs associated with the recommendation given above;
- An implementation plan where road construction projects are prioritized in terms of risk and impact in the short, medium, and long term.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

- Identifying the potential funders for the various projects

Planned road infrastructure developments within the Merafong City Local Municipality will be considered for the phased implementation plan.

This, in turn, will assist in achieving the following goals:

- Enable people to commute safely between their homes and places of work;
- Establish roads that will provide access to strategic points i.e. hospitals, schools, clinics, businesses, sport fields and cemeteries;
- Establish key linkages allowing communities in Merafong to move with greater freedom considering the topography prevalent in the area;
- Address cross-border (between Municipalities) transportation concerns as said areas are often neglected considering it is located on the edge of the functional planning area of Municipalities;
- Identify the roads that will assist in promoting tourism and access to place of interest whilst
- Stimulating economic growth in rural areas.

In addition to the above, embedded objectives of the Master Plan are the following which are related to service delivery

- preservation of the road network is ensured;
- the promotion of road safety;
- providing access to amenities and improving access where it exists;
- The promotion of non-motorised transport (NMT).

The following additional sub-objectives of the Master Plan are related to poverty alleviation during implementation:

- Ensuring utilization of local labour to enhance job creation by use of labour construction method; and
- Facilitating empowerment of contractors and suppliers from historically disadvantaged backgrounds.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

According to the 2022/2023 Annual Report indicates that implementation of roads construction projects have been done in Khutsong and Kokosi townships. Maintenance of existing roads is currently a challenge within the municipality due to budgetary constraints. The financial crisis is worsening the current backlog of the municipality's roads and stormwater infrastructure. Efforts to eliminate the backlog for gravel roads has been futile.

The following priorities have been set in the 2023/2024 IDP.

- Access to tarred/paved roads to formal areas
- Grading of gravel roads in formal and informal areas
- Repair of potholes in municipal tarred roads
- Installation of speed humps

The following community priorities for stormwater have been identified

- In formal areas – functioning of Stormwater drainage system
- Maintenance of kerb inlets
- Maintenance of Stormwater drainage system

An aspect hindering the development of a comprehensive roads master plan is the fact that Merafong has no Local Economic Development strategy.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

4.0 MASTERPLAN – ROADS INFASTRUCTURE

4.1 CONDITIONAL ASSESSMENT

The existing roads were visually assessed to determine the current condition. The roads vary considerably in quality. There is a need to begin a proper road management programme in order to ensure good maintenance. The deteriorating condition of particularly surfaced roads, as a result of irregular maintenance, is a tangible concern. There are no detailed pavement conditions available to determine or predict the life of the roads or to prepare a strategic plan for maintenance and upgrading.

The trend has been to allow the riding quality and structural condition of a pavement to deteriorate to a poor condition before taking measures to redress the situation. This has often resulted in high-cost rehabilitation projects. In some instances, the municipality has not been able to afford such costly projects, and the result is roads that are in a deplorable state that sometimes lead to accidents.

4.2 Status Quo Evaluation

The roads within the various study areas for MCLM were inspected during March and April 2024 as tabled below and the general conditions of the roads were noted.

Table 1: Site visits for visual assessments

Site	Date
Khutsong	Friday, 23 February 2024
Wedela	Monday, 11 March 2024
Elandsrand and Elandsridge	Tuesday, 12 March 2024
Fochville and Kokosi	Thursday, 14 March 2024
Phomolong and Letsatsing	Wednesday, 27 March 2024
Blybank, Oberholzer and Welverdiend	Thursday, 28 March 2024
Carletonville, Western deep levels and Blyvooruitzicht	Monday, 08 April 2024
Deelkraal and Doornfontein	Tuesday, 09 April 2024

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Leeupoort, Glenharvie and Wagterskop	Wednesday, 10 April 2024

Visual condition assessment of the existing road were carried out as scheduled above in order to establish the following:

- Type of surface defects,
- Extent and degree of failure,
- Possible causes of pavement failures, and
- Propose the road upgrade strategies to be implemented.
-

Conditions for the roads in each town were rated as per table below.

Table 2: Conditions assessment matrix

Good	acceptable riding quality with minor defects
Fair	potholes; edge breaks; cracks on road surface; walkways overgrown with grass; pavement failures
Poor	distressed; potholes; edge breaks; cracked surface; numerous evidence of pavement failures; poor riding quality; no stormwater management
Bad	unsafe for vehicles to travel on a road; gravel, extreme pavement failures; surfacing washed away; no stormwater drainage structures

4.2.1 Road Classification

Roads should be classified exclusively on the basis of their function in any particular area. The functional classification therefore cannot be derived from unrelated criteria such as the current type, size or condition of the road network. The fact that a road has been built or managed to a particular standard does not mean that it has a particular function.

All the assessed roads were classified according to TRH26 table below.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Table 3: six-class rural and urban road classification

Number	Function	Description
Class 1	Mobility	Principal arterial
Class 2		Major arterial
Class 3		Minor arterial
Class 4	Access/activity	Collector street
Class 5		Local street
Class 6		Walkway

The table above was used for the visual inspections.

4.3 General Assessment

The road infrastructure of MCLM is varied in terms of level of service within each of the towns, and also varies from town to town. Poor quality of some roads, particularly in the townships, makes access difficult, especially for emergency vehicles. Bus transport is also not possible in these areas. It has also been noted that Merafong does not have a bus service and this should be prioritized in the plans. This approach will easing financing burden for the locals who might not be able to effort the steep cost of the taxis that are readily available. This will mean bus furniture would be upgraded or installed based on the Traffic impact Assessment that would be done at a later stage.

4.4 Visual Assessments of Towns being maintained directly by Merafong City Municipality

4.4.1 Study Area 1 – Wedela

Wedela is situated between Western Deep Levels and Elandsrand mine. The town's name is derived from the prefixes of the two mines: the ‘Wed-' from Western Deep Levels and the ‘-ela' from Elandsrand.

Wedela was established as a mining village in December 1978 by Harry Oppenheimer, and municipal status was granted to the town on 1 January 1990.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Wedela can be classified as a semi urban developed area

Figure 4: Wedela locality map (Google earth)

- The level of service varies from high density to middle density housing.
- Wedela North and Wedela South-West road infrastructure is in an unacceptable state.
- There is little or no sign of routine maintenance being done in the area.
- The roads are constricted in width approximately 5m wide with no pedestrian sidewalks.
- The road infrastructure also ranges from extreme dilapidation condition on one side of 4th Avenue to an acceptable condition on the other side.
- Three types of road conditions were noted namely asphalt surfaces, block paved and gravel roads.
- **The stormwater** was not adequately catered for. There were a few culverts that noted and would require reconstruction due to external damages from accidents.
- One culvert was washed away. There is evidence to show that it was under designed as well as poor workmanship. There is also a possibility that the culvert was poorly aligned to the water course. The culvert was probably a 2x1200mm

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

diameter culvert. Some of the galvanized steel barrel have been stolen/vandalised after they were exposed.

- Currently the road has been closed off. The culvert is located at the following coordinates 26°28'32.68"S and 27°22'1.12"E, this is along (Alfred Kobi street) the road that links Wedela to Elandsrand.

4.4.2 Visual Assessment result summary

Figure 5:Internal street intersection conditions

Figure 6: Dilapidated state of the road

Figure 7: Condition of block paved street

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005


Figure 8:Washed away culvert on Alfred Kobi street

Figure 9: Gravel road

Figure 10: One culvert within the residential area

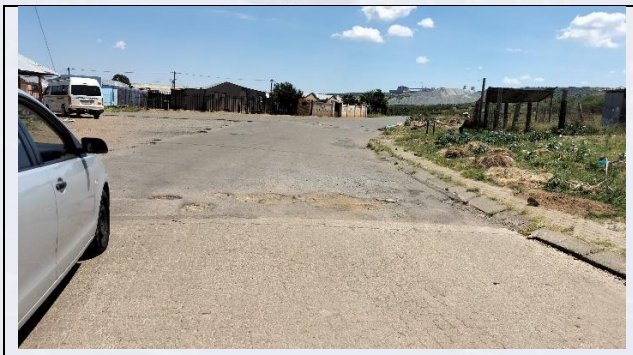



Figure 11: External/Major street conditions

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Figure 12: Tax rank as you enter into Wedela

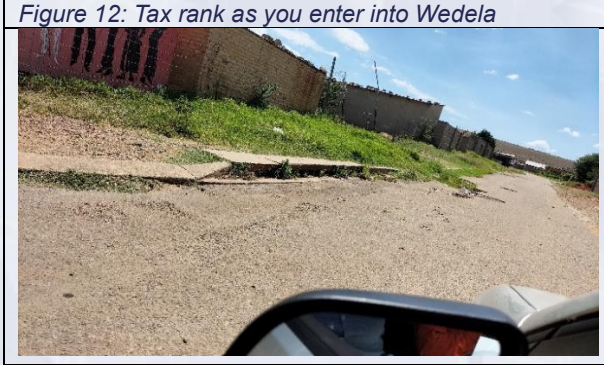


Figure 13: Kerb inlet condition

Figure 14: One major culvert in fair condition

Table 4: Summary of Wedela condition assessment

Type Of Road	Length (km)	Type of surfacing	Current surface and Pavement condition	Current Stormwater management	Rating	Proposed Intervention	Percentage needing immediate intervention
Minor arterial	2,7	Block paving	good	acceptable; one culvert washed away further west		reseal; routine maintenance; pothole patching; replace washed away culvert	61%
	7,8	Asphalt	fair	No culvert noted, Kerb inlets blocked with debris and objects from upstream		reseal; routine maintenance; pothole patching; partial pavement reconstruction; drainage improvement	
Collector street	14,9	Asphalt	Poor	poor; no drainage infrastructure		pavement reconstruction; drainage improvement	
Local street	3,55	Block paving	good	acceptable;		stormwater improvement	
	18,4	Asphalt	Bad	extremely poor		road reconstruction; drainage improvement	
	1,3	Gravel	Bad	extremely poor; one bridge identified with steel walkway		road upgrade ; drainage improvement	
Total	**48,65**						

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

4.4.3 Study Area 2 – Khutsong North and South

Khutsong is a township on the West Rand District Municipality of South Africa. It is situated north-west of the town of Carletonville, in the Merafong City Local Municipality of the Gauteng province. It was established in 1958 as a satellite township to house mining labourers.

It comprises of the northern and southern side. The level of service currently is poor and consist of road infrastructure which is predominantly gravel. The northern side has higher service level compared to the southern side. The roads are mostly surfaced with a quite a significant number of access roads still gravel

Major access roads are surfaced and requiring timeous routine maintenance and reseals, however the bulk of the internal roads are still gravel.

4.4.3.1 Dolomite Challenges

It has also been noted that MCLM is underlain with dolomite. Geological studies determined that 90% of the current residential area of Khutsong is situated on high-risk dolomite zones, which are unsuitable for human settlement.

Khutsong is prone to sinkholes and currently there are identified projects underway to rehabilitate the sinkholes. It is however it is critical that provision for rehabilitation of future sinkholes be made in the master plan.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Figure 15: Khutsong locality map (Google earth)

4.4.3.2 Visual Assessment result summary

Figure 16: Sinkhole in Khutsong North

Figure 17: Condition of roads in Khutsong North


Figure 18: Roads conditions requiring urgent intervention


Figure 19: Stormwater management upgrades and repairs required


Figure 20: Stormwater drainage-lined trapezoidal open channel


Figure 21: Public Transport facilities

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005


Figure 22: Conditions of gravel roads

4.4.3.3 Khutsong North

Table 5: Summary of Khutsong North condition assessment

Type of Road	Length (km)	Type of surfacing	Current surface and Pavement condition	Current Stormwater management	Rating	Proposed Intervention	Percentage needing immediate intervention
Minor arterial	8,8	Asphalt	Poor	poor		reseal; routine maintenance; reseal and partial pavement reconstruction; drainage improvement	
Collector street	30,4	Gravel	bad	no drainage		road upgrade ; drainage improvement	
	3,5	Paving	fair	poor		Cleaning and surface improvement	
	5,5	Asphalt	Poor	poor		reseal; routine maintenance; reseal and partial pavement reconstruction; drainage improvement	87%
Local street	16,6	Asphalt	Poor	poor		reseal; routine maintenance; reseal and partial pavement reconstruction; drainage improvement	
	0	Paving	fair	poor		Cleaning and surface improvement	
	81,8	Gravel	Bad	no drainage		road upgrade ; drainage improvement	
Total	**146,6**						

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

4.4.3.4 Khutsong South

Table 6: Summary of Khutsong South condition assessment

Type of Road	Length (km)	Type of surfacing	Current surface and Pavement condition	Current Stormwater management	Rating	Proposed Intervention	Percentage needing immediate intervention
Minor arterial	22,6	Asphalt	Poor	poor		reseal; routine maintenance; reseal and partial pavement reconstruction; drainage improvement	62%
Collector street	16.5	Gravel	bad	no drainage		road upgrade ; drainage improvement	
	3,5	Paving	fair	poor		Cleaning and surface improvement	
	14,1	Asphalt	Poor	poor		reseal; routine maintenance; reseal and partial pavement reconstruction; drainage improvement	
Local street	79,4	Asphalt	Poor	poor		reseal; routine maintenance; reseal and partial pavement reconstruction; drainage improvement	
	36,6	Gravel	Bad	no drainage		road upgrade ; drainage improvement	
Total	**172.7**						

4.4.3.5 Khutsong Totals

Table 7: Summary of Khutsong condition assessment

Type of Road	Length (km)	Type of surfacing	Current surface and Pavement condition	Current Stormwater management	Rating	Proposed Intervention	Percentage needing immediate intervention
Minor arterial	31,4	Asphalt	Poor	poor		reseal; routine maintenance; reseal and partial pavement reconstruction; drainage improvement	87%
Collector street	46.9	Gravel	bad	no drainage		road upgrade ; drainage improvement	
	7	Paving	fair	poor		Cleaning and surface improvement	
	19,6	Asphalt	Poor	poor		reseal; routine maintenance; reseal and partial pavement	

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

						reconstruction; drainage improvement
Local street	96	Asphalt	Poor	poor		reseal; routine maintenance; reseal and partial pavement reconstruction; drainage improvement
	0	Paving	fair	poor		Cleaning and surface improvement
	118,4	Gravel	Bad	no drainage		road upgrade ; drainage improvement
Total	**319.3**					

4.4.4 Study Area 3 – Kokosi

Kokosi is south west of Fochville and can be considered as a farming and mining town located in the Gauteng province of South Africa. It is part of the Merafong City Local Municipality. It consists of both formal and informal residential settlement. This is evidence of new settlements being developed in the area where there are RDP houses being built and serviced.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Figure 23: Kokosi locality map (Google earth)

The road infrastructure consists of both surfaced and gravel roads. The gravel section forms close to 50% of the entire road network in the area.

4.4.4.1 Visual Assessment result summary

Figure 24: Internal streets conditions

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Figure 25: Informal settlements gravel roads

Figure 26: Bicycles as a mode of transport that needs to be catered for on main roads

Figure 27: RDP Houses roads being constructed

Figure 28: Intersection condition changes on the main road- A Lembede Dr

Figure 29: Change in conditions of the roads as you enter Kokosi along A Lembede Dr

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005


Figure 30: Few kerb inlets identified

Table 8: Summary of Kokosi condition assessment

Type of Road	Length (km)	Type of surfacing	Current surface and Pavement condition	Current Stormwater management	Rating	Proposed Intervention	Percentage needing immediate intervention
Minor arterial	6,5	Asphalt	Poor	poor		reseal; routine maintenance; reseal and partial pavement reconstruction; drainage improvement	75%
Collector street	13,2	Gravel	bad	no drainage		road upgrade ; drainage improvement	
	4,8	Paving	fair	poor		Cleaning and surface improvement	
	13	Asphalt	Poor	poor		reseal; routine maintenance; reseal and partial pavement reconstruction; drainage improvement	
Local street	16,6	Asphalt	Poor	poor		reseal; routine maintenance; partial pavement reconstruction; drainage improvement	
	4,5	Paving	fair	poor		Cleaning and surface improvement	
	43	Gravel	Bad	no drainage		road upgrade ; drainage improvement	
Total	**101,6**						

4.4.5 Study Area 4 – Fochville

Fochville is a farming and mining town located in the Gauteng province of South Africa. It is part of the Merafong City Local Municipality. The area surrounding Fochville contains Sotho or Tswana ruins. Tlokwe Ruins are the remains of Sotho-Tswana settlements on the hills surrounding Fochville that were inhabited until the 1820s. Boer War hero Daniel Theron was killed 5 km north of the town.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

The town itself was established as an agricultural centre in 1920 and was named after the World War I commander-in-chief of the Allied forces in France, Marshal of France Ferdinand Foch.

Fochville has two primary schools and one high school. The road infrastructure in Fochville is in generally in fair condition. Routine maintenance is highly recommended with a few pavement reconstructions. There is indication that the roads are old and there is evidence of stone loss on road surfaces and numerous cracks. The riding quality is generally poor

Figure 31: Fochville locality map (Google earth)

4.4.5.1 Visual Assessment result summary

Figure 32: General condition of some street

Figure 33: Evidence of scattered maintenance works

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Figure 34: Condition of some street in good condition

Figure 35: Evidence of surface corrugation

Figure 36: Condition of some street in good condition

Figure 37: Kerb inlet in place which would require cleaning and replacement in some cases

Figure 38: Evidence of poor stormwater management-siltation, in some cases

Table 9: Summary of Fochville condition assessment

Type of Road	Length (km)	Type of surfacing	Current surface and Pavement condition	Current Stormwater management	Rating	Proposed Intervention	Percentage needing immediate intervention
Minor arterial	8,5	Asphalt	Poor	acceptable		reseal; routine maintenance; reseal and partial pavement reconstruction; drainage improvement	33%

Collector street	1,5	Gravel	bad	no drainage		road upgrade ; drainage improvement	
	31,1	Asphalt	fair	acceptable		Rip and reconstruct the base and surfacing. Use of interlocking blocks recommended	
Local street	54,2	Asphalt	fair	acceptable		Rip and reconstruct the base and surfacing. Use of interlocking blocks recommended	
	3,2	Gravel	Bad	no drainage		road upgrade ; drainage improvement	
Total	**98,5**						

4.4.6 Study Area 5 – Greenspark

Greenspark is a settlement in Merafong City Local Municipality. It is located South-East of Fochville town. The town is accesses through R500 and Loospruit Avenue.

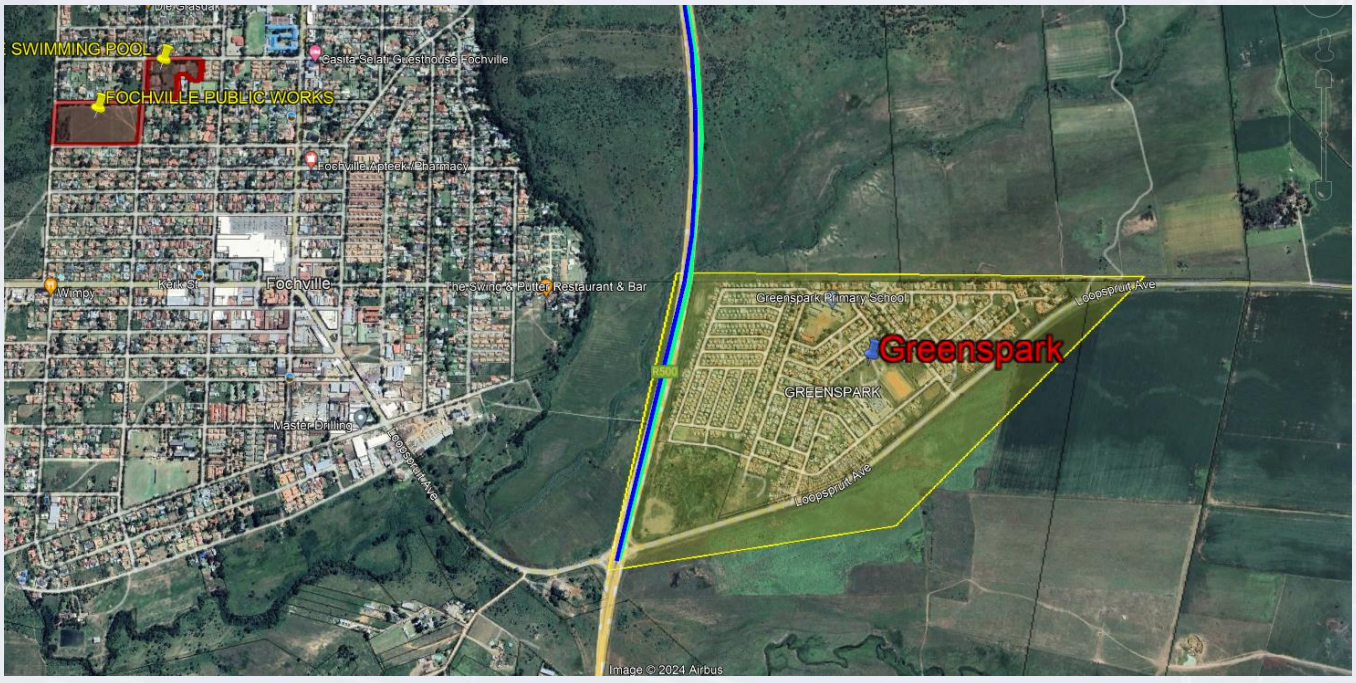


Figure 39: Greenspark Locality Map

4.4.6.1 Visual Assessment result summary

Figure 40: Some roads are asphalt surfaced and others block Paved

Figure 41:Gravel roads

Figure 42: Loopspruit Avenue

Figure 43: Loopspruit Avenue

Figure 44: Stormwater Kerb inlet

Figure 45: Silted grid inlet

Table 10: Summary of Greenspark condition assessment

Type of Road	Length (km)	Type of surfacing	Current surface and Pavement condition	Current Stormwater management	Rating	Proposed Intervention	Percentage needing immediate intervention
Minor arterial	10	Asphalt	Poor	acceptable		reseal; routine maintenance; reseal and partial pavement reconstruction; drainage improvement	36%
Collector street	1,1	Asphalt	fair	acceptable		reseal; routine maintenance; reseal and partial pavement	

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

						reconstruction; drainage improvement	
Local street	5,4	Asphalt	fair	acceptable		reseal; routine maintenance; reseal and partial pavement reconstruction; drainage improvement	
	2,1	Paving	good	poor		reseal and drainage improvement	
	1	Gravel	Bad	no drainage		road upgrade ; drainage improvement	
Total	**19,6**						

4.4.7 Study Area 6 – Oberholzer

Eberholzer is a town within Carletonville constituency which was proclaimed in 1939. There are no distinct boundaries separating Carletonville & Oberholzer. The town was named after the owner of a farm, Hendrick Oberholzer.

The road conditions range from fair to poor condition with scattered bad sections. There is little to no sign of routine maintenance having been done. Transverse and longitudinal cracks are predominant. The stormwater is generally conveyed by stormwater pipes as evidenced by the kerb inlets along most of the roads. There is a portion of the roads that is dualised. The stormwater infrastructure seems to be in fairly good condition. Most kerb inlet covers will need to be replaced.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Figure 46: Oberholzer locality map

4.4.7.1 Visual Assessment result summary

Figure 47: cracked surface

Figure 48: corrugated surfaces

Figure 49: streets in fairly good conditions


Figure 50:kerb inlets needing cover replacement and cleaning

Table 11: Summary of Oberholzer condition assessment

TYPE OF ROAD	Length (km)	Type of surfacing	Current surface and Pavement condition	Current Stormwater management	Rating	Proposed Intervention	Percentage needing immediate intervention
Minor arterial	60,3	Asphalt	poor	acceptable		reseal and pavement reconstructions and drainage improvement	50%
Collector street	13,3	Asphalt	poor	acceptable		reseal and pavement reconstructions and drainage improvement	
Access roads	24,8	Asphalt	poor	acceptable		reseal and pavement reconstructions and drainage improvement	
Total	**98,4**						

4.4.8 Study Area 7 – Carletonville

Carletonville is a town in Gauteng in Merafong City Local Municipality in the West Rand District Municipality in Gauteng, South Africa. It was developed by various mining companies from 1937 onwards. It was named after the long-serving mining director of Consolidated Gold Fields, Guy Carleton Jones, but was not officially incorporated until 1959.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

The road conditions range from fair to poor condition with scattered bad sections. There is little to no sign of routine maintenance having been done. Transverse and longitudinal cracks are predominant. The stormwater is generally conveyed by stormwater pipes as evidenced by the kerb inlets along most of the roads. There is a portion of the roads that is dualised. The stormwater infrastructure seems to be in fairly good condition. Most kerb inlet covers will need to be replaced.

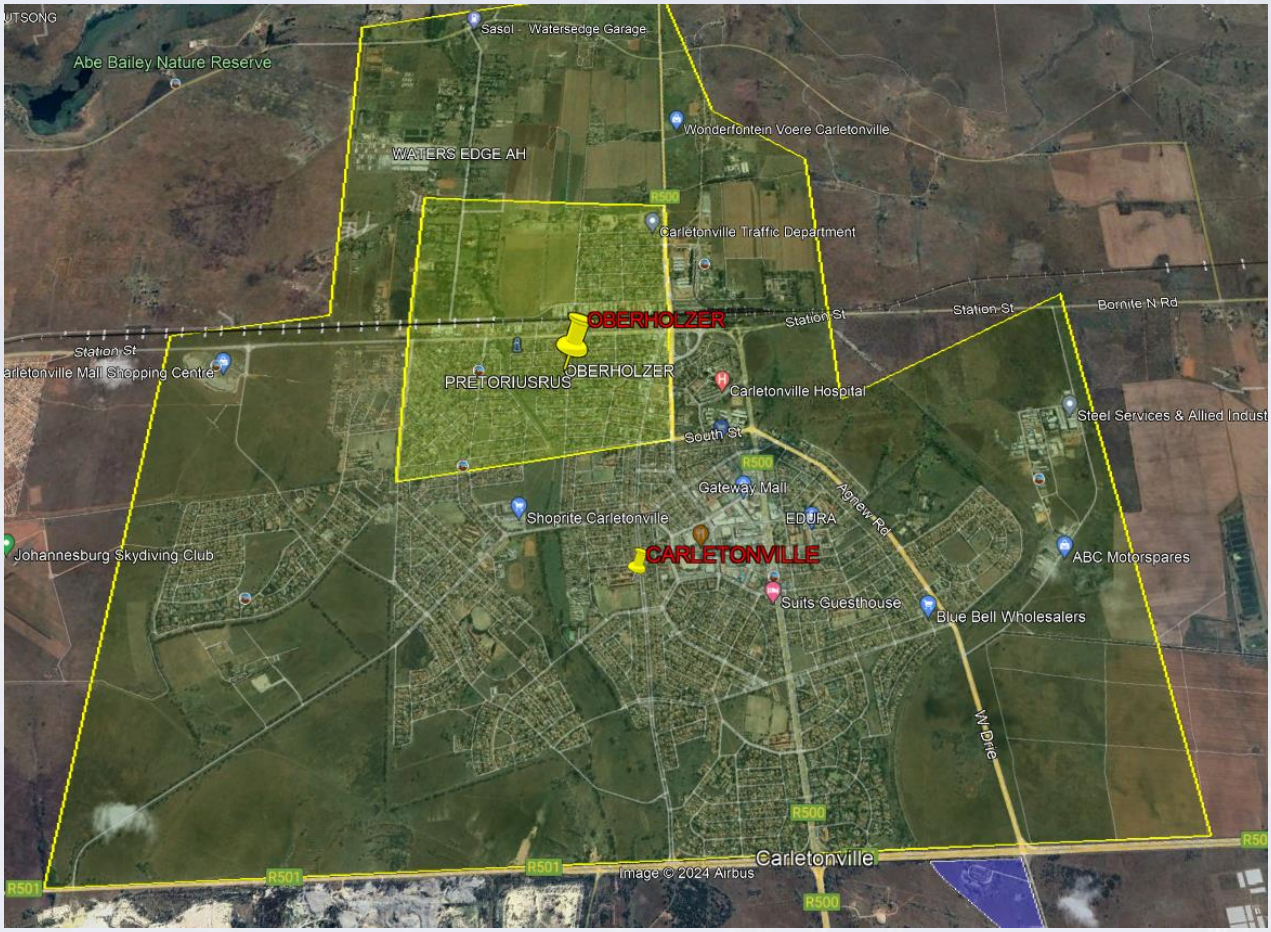


Figure 51: Carletonville locality map

4.4.8.1 Visual Assessment result summary


Figure 52: Dual carriageway


Figure 53: Road condition- cracking and pothole sealing


Figure 54: Road conditions on some of the worst street

Figure 55: Poor Stormwater management


Figure 56: Bridge structure

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Table 12: Summary of Carletonville condition assessment

Type of Road	Length (km)	Type of surfacing	Current surface and Pavement condition	Current Stormwater management	Rating	Proposed Intervention	Percentage needing immediate intervention
Minor arterial	4` 1,8	Asphalt	poor	acceptable		reseal and pavement reconstructions and drainage improvement	
Collector street	3	Gravel	bad	acceptable		road upgrade ; drainage improvement	
	54	Asphalt	poor	acceptable		reseal and pavement reconstructions and drainage improvement	54%
Access roads	110,88	Asphalt	poor	acceptable		reseal and pavement reconstructions and drainage improvement	
	17	Gravel	bad	no drainage		road upgrade ; drainage improvement	
Total	**226,68**						

4.4.9 Study Area 8 – Blybank

Blybank is a suburb in Merafong City, West Rand District Municipality, Gauteng. There is a piece of land that has not yet been developed, possibly set aside for future development. There is however road demarcations with road names already in place. A town planner would be required to confirm this.

The road infrastructure in Blybank have a general crossfall i.e. the road generally drains from one side of the road and not both sides.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Figure 57: Blybank Locality map

4.4.9.1 Visual Assessment result summary

A visual assessment was done on a rainy day which enabled accurate assessment of the stormwater management in the area.

Figure 58: East Avenue state

Figure 59: Condition of some roads; cross fall

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Figure 60: Road closure at Curfew road close to Pelican Avenue supposedly due to a sinkhole

Figure 61: Kerb inlet working perfectly. Cleaning and clearing of the opening required

Figure 62: Stormwater deficits noted at most intersections noted

Table 13: Summary of Blybank condition assessment

Type of Road	Length (km)	Type of surfacing	Current surface and Pavement condition	Current Stormwater management	Rating	Proposed Intervention	Percentage needing immediate intervention
Minor arterial	15,9	Asphalt	fair	acceptable		reseal and drainage improvement	66%
Collector street	2	Gravel	bad	acceptable		road upgrade ; drainage improvement	
	4,5	Asphalt	fair	acceptable		reseal and drainage improvement	
Access roads	11,5	Asphalt	fair	acceptable		reseal and pavement reconstruction; drainage improvement	
	62,9	Gravel	bad	no drainage		road upgrade ; drainage improvement	

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

	1	paved	good	acceptable		road upgrade ; drainage improvement	
Total	**97,8**						

4.4.10 Study Area 9 – Welverdiend

Welverdiend is a small town in West Rand District Municipality in the Gauteng province of South Africa. Welverdiend is situated 5 km west of Doornfontein.

The roads in Welverdiend are very old and dilapidated on some sections. Pothole sites are common on minor streets which has significant traffic volume. The roads need rehabilitation on these streets. Internal access roads are in fair condition and would need minor rehabilitation.

There is also a section of the access roads that is gravel. The gravel section seems to have been graded only without layer works.

Figure 63: Welverdiend Locality Map

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

4.4.10.1 Visual Assessment result summary


Figure 64: Poor Road condition for Welverdiend North


Figure 65: Intersection conditions for Road for Welverdiend North


Figure 66: Gravel Roads for Welverdiend North

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mubunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Figure 67: Kerb inlet for Welverdiend South

Figure 68: Poor stormwater management Welverdiend South

Figure 69: Gravel roads where there are new RDP roads

Table 14: Welverdiend Conditional Assessment

Type of Road	Length (km)	Type of surfacing	Current surface and Pavement condition	Current Stormwater management	Rating	Proposed Intervention	Percentage needing immediate intervention
Minor arterial	16,53	Asphalt	fair	acceptable		reseal and drainage improvement	68%
Collector street	3	Gravel	bad	no drainage		road upgrade ; drainage improvement	
	2,2	Asphalt	fair	acceptable		reseal and drainage improvement	
Access roads	19	Asphalt	fair	acceptable		reseal and pavement reconstruction; drainage improvement	
	3,5	Gravel	bad	no drainage		road upgrade ; drainage improvement	
Total	**44,23**						

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

4.5 Visual Assessments of Towns being maintained directly by the mines

4.5.1 Study Area 10 – Elandsrand

Elandsrand is a small mining town approximately 10km outside Carletonville next to Blyvooruitzicht. It is near Western Deep Levels to the East and Deelkraal to the West. It has twin shafts very close to each other, one being a production shaft, the other a service shaft for men and equipment.

Mine workers are accommodated for in a closed residential area. The area is access controlled right at the entrance that caters for broadly Elandsrand and Elandsridge and privately at each entrance. Mine workers and their family are sheltered at this regulated facilities.

The internal roads for the Elandsrand camp consist of concrete/rigid pavements.

The pavement is very old and shows minimal signs, if any of routine maintenance having been done. External access roads have flexible pavements.

Figure 70: Elandsrand locality map (Google earth)

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

4.5.1.1 Visual Assessment result summary

Collector/ Local streets condition

Figure 71: Condition of concrete pavements Photograph 1

Figure 72: Condition of concrete pavements

Figure 73: Open channel drain

Figure 74: Kerb inlet along Elandsrand Dr towards to Elandsridge

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Table 15: Summary of Elandsrand condition assessment

TYPE OF ROAD	Length (km)	Type of surfacing	Current surface and Pavement condition	Current Stormwater management	Rating	Proposed Intervention	Percentage needing immediate intervention
Minor arterial	3,1	Asphalt	fair	No culvert noted, Kerb inlets blocked with debris and objects from upstream		reseal; routine maintenance; reseal and partial pavement reconstruction; drainage improvement	52%
Collector street	2,5	Gravel	bad	no defined drainage		road upgrade ; drainage improvement	
	4,7	Asphalt	fair	poor; no drainage structures		pavement reconstruction; drainage improvement	
Local street	4,6	Concrete	Bad	extremely poor		Rip and reconstruct the base and surfacing. Use of interlocking blocks recommended	
	1,5	Gravel	Bad	extremely poor		road upgrade ; drainage improvement	
Total	**16,4**						

4.5.2 Study Area 11 – Elandsridge

Elandsridge is less than a kilometer from Elandsrand which is also a small mining town approximately

10km outside Carletonville next to Blyvooruitzicht. It also provides the twin shafts with the additional workforce.

Mine workers are accommodated for in a closed residential area. The area is access controlled. Mine workers and their family are accommodated at this regulated facilities.

The internal roads for the Elandsridge camp consist of flexible pavements.

The internal access roads are in generally fair condition and require reseals and routine maintenance. External access roads also have flexible pavements.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Figure 75: Elandsridge locality map (Google earth)

4.5.2.1 Visual Assessment result summary

Figure 76: External/ Major roads

Figure 77: Internal/Minor access roads

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005


Figure 78: Access roads


Figure 79: Stormwater structures-Kerb Inlet

Table 16 : Summary of Elandsridge condition assessment

TYPE OF ROAD	Length (km)	Type of surfacing	Current surface and Pavement condition	Current Stormwater management	Rating	Proposed Intervention	Percentage needing immediate intervention
Minor arterial	2,3	Asphalt	good	acceptable		reseal; routine maintenance; reseal and partial pavement reconstruction; drainage improvement	
Collector street	1,1	Gravel	bad	no drainage		road upgrade ; drainage improvement	
	9,2	Asphalt	fair	acceptable		reseal and pavement reconstruction; drainage improvement	20%
Local street	6,3	Asphalt	fair	acceptable		Rip and reconstruct the base and surfacing. Use of interlocking blocks recommended	
	0,8	Gravel	Bad	no drainage		road upgrade ; drainage improvement	
Toal	**19,7**						

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

4.5.3 Study Area 12 – Letsatsing

Letsatsing is a small town located south-east of Carletonville close to road R501. There is a school by the name Letsatsing combined which comprises of a Primary and Secondary schools.

The roads can be rated as ranging from fair to poor state. The road widths are also quite narrow on most of the access roads.

Figure 80: Letsatsing Locality map

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

4.5.3.1. Visual Assessment result summary

Figure 81: Intersection leading to Letsatsing

Figure 82: Entrance into the school

Figure 83: Minor road into Letsatsing

Figure 84: Pavement surface condition

Figure 85: Narrow internal access roads

Figure 86: Concrete Pavement condition

Table 17: Summary of Letsatsing condition assessment

Type of Road	Length (km)	Type of surfacing	Current surface and Pavement condition	Current Stormwater management	Rating	Proposed Intervention	Percentage needing immediate intervention
Minor arterial	10	Asphalt	fair	Need improvement		reseal and drainage improvement	19%
Collector street	2,5	Gravel	bad	no drainage		road upgrade ; drainage improvement	
	1,4	Asphalt	fair	Need improvement		reseal and pavement reconstruction; drainage improvement	
Access roads	7,2	Asphalt	fair	Need improvement		reseal and pavement reconstruction; drainage improvement	
	1,2	Concrete	Poor	Need improvement		reseal and pavement reconstruction; drainage improvement	
	0,8	Gravel	Bad	no drainage		road upgrade ; drainage improvement	
Total	**23,1**						

4.5.4. Study Area 13 – Phomolong

Phomolong is a town South East of Letsatsing and comprises of a normal residential areas (East Village) and mining workers accommodation. There is also an informal section on the further south. The town has one of the biggest mine in the Merafong called Sibanye Gold Driefontein Mine.

The road network condition ranges from fair to bad. This is a mining town. It is not clear if the miners are responsible for the residential road infrastructure or not.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mubunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Figure 87: Phomolong Locality Map

4.5.5. Visual Assessment result summary

Figure 88: Transverse cracks on roads surface

Figure 89: surface corrugation for some road surface

Figure 90: Some road sections with paved surfaces in good condition


Figure 91: Informal settlements with gravel roads

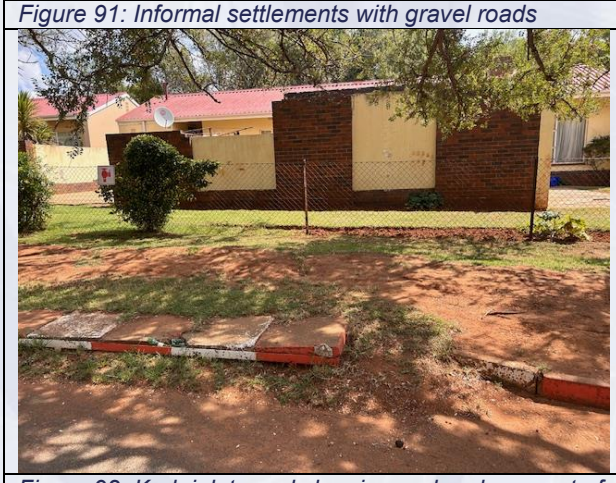



Figure 92: Kerb inlet need cleaning and replacement of covers

Table 18: Summary of Phomolong condition assessment

Type of Road	Length (km)	Type of surfacing	Current surface and Pavement condition	Current Stormwater management	Rating	Proposed Intervention	Percentage needing immediate intervention
Minor arterial	17,5	Asphalt	fair	acceptable		reseal and drainage improvement	
Collector street	15	Gravel	bad	acceptable		road upgrade ; drainage improvement	
	5,2	Asphalt	fair	acceptable		reseal and drainage improvement	
Access roads	15,3	Asphalt	fair	acceptable		reseal and pavement reconstruction; drainage improvement	
	9,2	Gravel	bad	no drainage		road upgrade ; drainage improvement	
	5	Concrete	bad	acceptable		reseal and pavement reconstruction; drainage improvement	

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

	2	paved	good	acceptable		road upgrade ; drainage improvement	
Total	**69,2**						

4.5.5. Study Area 14 – Western Deep Levels

At 3,749 m, Western Deep Levels holds the record for the world's deepest gold mine.

It is located south of Carletonville.

The areas comprises of strict access control effluent residential areas to the south and accommodation for mine works to the north. We were refused access into the access controlled section.

The roads are relatively in fair condition with the exception of the mine workers residential area being in poor state. This area has rigid pavement which require replacement.

Figure 93: Western Deep Levels Locality Map

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

4.5.5.1. Visual Assessment result summary

Figure 94: Western Deep Levels entrance

Figure 95: Some road condition on isolated portions

Figure 96: Access controlled for mine workers quarters

Figure 97: Access controlled for effluent residential area

Figure 98: Intersection details

Figure 99: Mine workers hostels

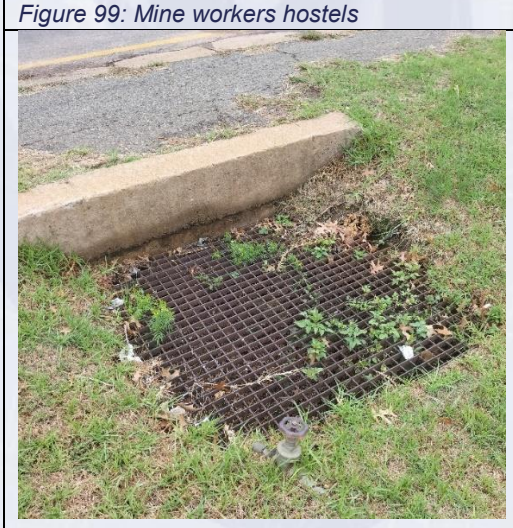


Figure 100: Grated inlet at the entrance into WDLs

Figure 101: Stormwater kerb inlet

Table 19: WDL Condition Assessment

Type of Road	Length (km)	Type of surfacing	Current surface and Pavement condition	Current Stormwater management	Rating	Proposed Intervention	Percentage needing immediate intervention
Minor arterial	3	Asphalt	fair	acceptable		reseal and drainage improvement	35%
Collector street	5	Gravel	bad	acceptable		road upgrade ; drainage improvement	
	26	Asphalt	fair	acceptable		reseal and drainage improvement	

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Access roads	11	Asphalt	good	acceptable		reseal and pavement reconstruction; drainage improvement	
	3	concrete	poor			Base reconstruction and new asphalt surface. Drainage improvement	
	14	Gravel	bad	no drainage		road upgrade ; drainage improvement	
Total	**62**						

4.5.6. Study Area 15 – Blyvooruitzicht

Blyvooruitzicht is a gold mine and gold-mining village in MCLM. It is situated about 5 kilometres south of the centre of Carletonville. The village was established in 1937 and was built to house the workers of the Blyvooruitzicht Gold Mine which was the first to mine the gold of the West Wits line. In the late 60's and early 70's it boasted having the highest earnings per capita in the world.

This village has one of the oldest roads we came across during the entire visual assessments.

The roads were surfaced but at this point the distress and deterioration has gone beyond maintenance activities. The road network needs a complete road reconstruction or rehabilitation.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

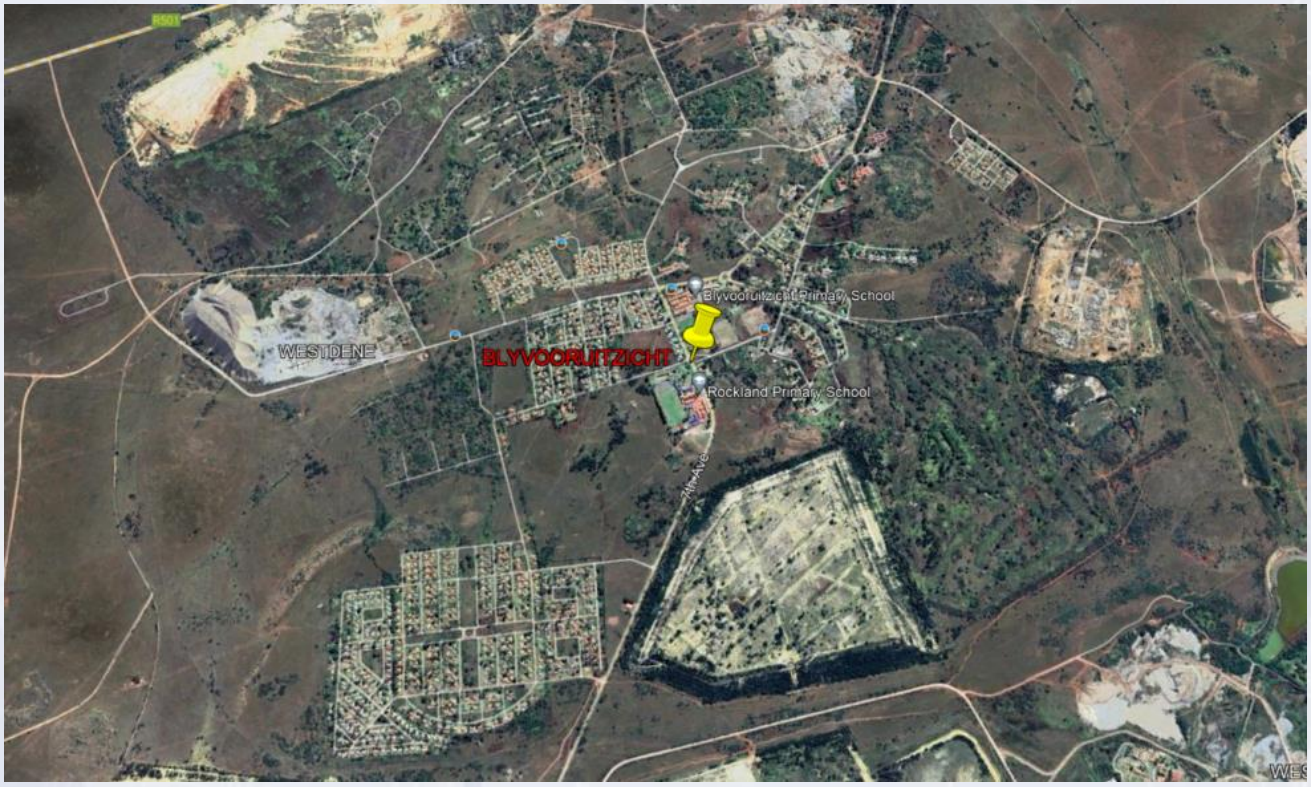


Figure 102: Blyvooruitzicht locality map

4.5.6.1. Visual Assessment result summary

Figure 103: General road condition which has undergone extensive distress

Figure 104: illegal roads being formed in a bid to avoid the poor roads

Figure 105: Stormwater was not catered for on all roads

Figure 106: General surface condition of the roads

Figure 107: Very narrow street

Table 20: Blyvooruitzicht condition assessment

Type of Road	Length (km)	Type of surfacing	Current surface and Pavement condition	Current Stormwater management	Rating	Proposed Intervention	Percentage needing immediate intervention
Minor arterial	3	Asphalt	poor	acceptable		reseal and drainage improvement	100%
Collector street	20	Gravel	bad	acceptable		road upgrade ; drainage improvement	
	18,7	Asphalt	bad	acceptable		reseal and drainage improvement	

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Access roads	27,1	Asphalt	bad	acceptable		reseal and pavement reconstruction; drainage improvement	
	15	Gravel	bad	no drainage		road upgrade ; drainage improvement	
Total	**83,8**						

4.5.7. Study Area 16 – Doornfontein

Doornfontein is a suburb in Merafong City, West Rand District Municipality. Doornfontein is situated nearby to the suburbs Welverdiend and Southdene in Blyvooruitzicht.

This town his quite small in size and has a few residential communities. The roads are also very old and generally in poor state. Internal access roads are very narrow and are in fair condition due to low volume of traffic.

Figure 108: Doornfontein locality map

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

4.5.7.1. Visual Assessment result summary

Figure 109: Narrow streets

Figure 110: Main street leading to the mines

Figure 111: Road surface disintegration

Table 21: Doornfontein Condition Assessment

Type of Road	Length (km)	Type of surfacing	Current surface and Pavement condition	Current Stormwater management	Rating	Proposed Intervention	Percentage needing immediate intervention
Minor arterial	6	Asphalt	fair	acceptable		reseal and drainage improvement	67%
Collector street	10	Gravel	bad	acceptable		road upgrade ; drainage improvement	
	14	Asphalt	bad	acceptable		reseal and drainage improvement	
Access roads	5	Asphalt	bad	acceptable		reseal and pavement reconstruction; drainage improvement	
	4	Gravel	bad	no drainage		road upgrade ; drainage improvement	

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

	0	paved	good	acceptable		road upgrade ; drainage improvement	
Total	**39**						

4.5.8. Study Area 17 – Deelkraal

Deelkraal is situated nearby to the suburbs Elandsridge and Wedela. The town is relatively small and has low volume of vehicle traffic. There is a

The road network has deteriorated significantly. Some of the streets have not yet been surfaces in some areas as the town grows.

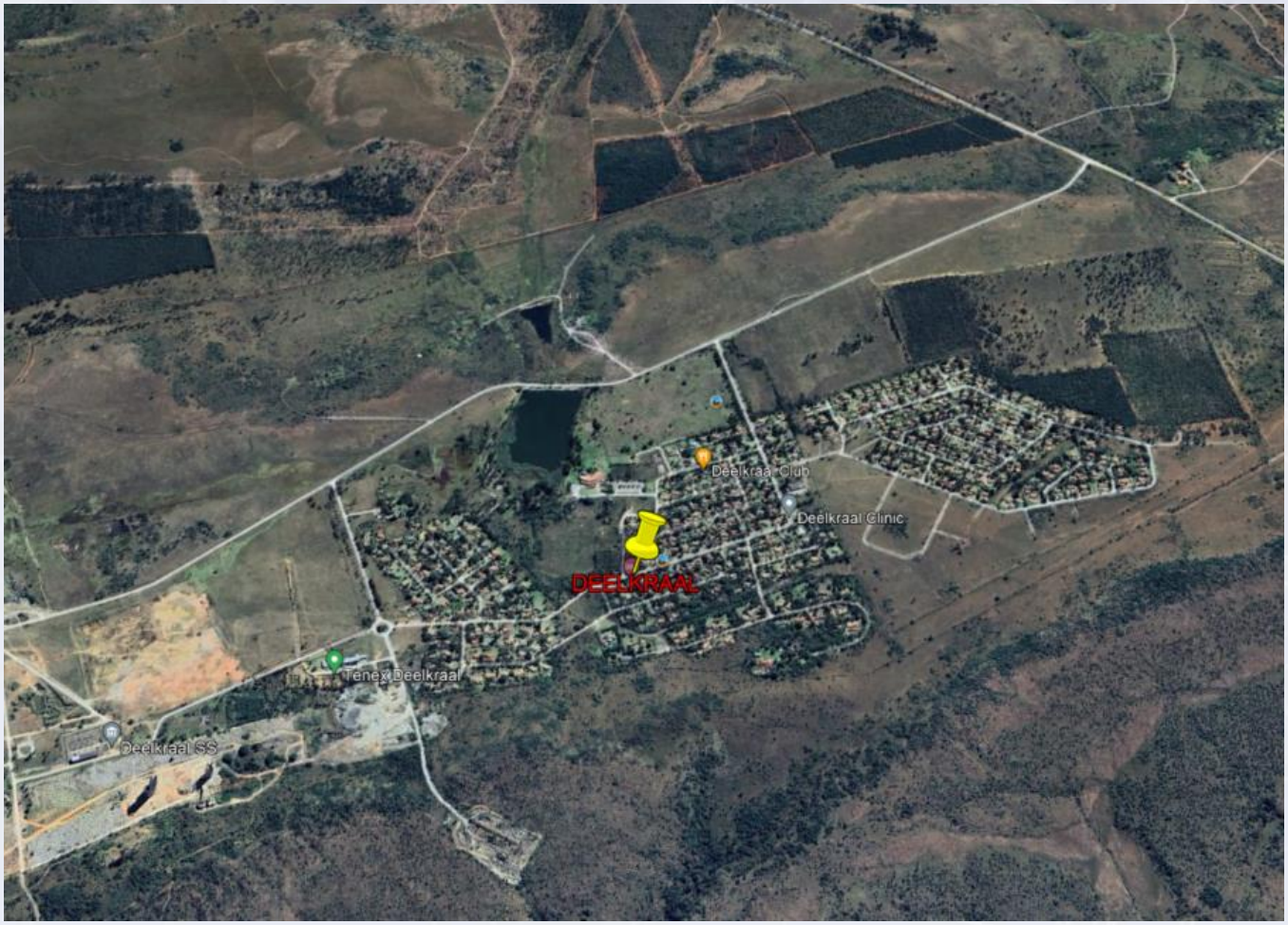


Figure 112: Deelkraal locality map

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

4.5.8.1. Visual Assessment result summary

Figure 113: General Street conditions

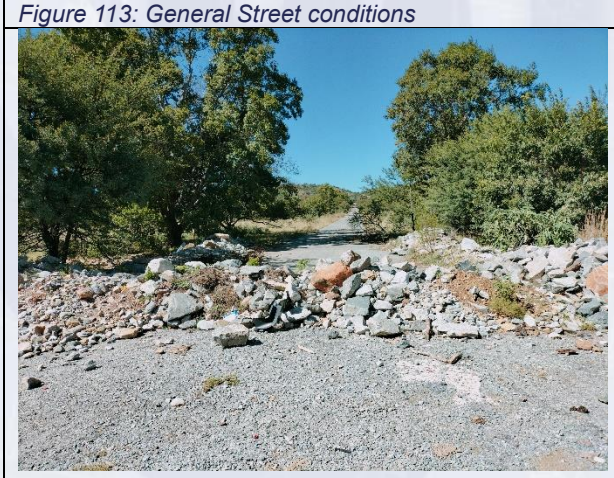


Figure 114: Street closed off probably due to a sinkhole

Figure 115: Intersection condition, Deelkraal Drive

Figure 116: Stormwater channel and junction box

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005


Figure 117: Clogged Kerb inlets

Table 22: Deelkraal Conditional Assessment

Type of Road	Length (km)	Type of surfacing	Current surface and Pavement condition	Current Stormwater management	Rating	Proposed Intervention	Percentage needing immediate intervention
Minor arterial	7	Asphalt	fair	acceptable		reseal and drainage improvement	38%
Collector street	1,5	Gravel	bad	acceptable		road upgrade ; drainage improvement	
	6	Asphalt	poor	acceptable		reseal and drainage improvement	
Access roads	12,1	Asphalt	fair	acceptable		reseal and pavement reconstruction; drainage improvement	
	4	Gravel	bad	no drainage		road upgrade ; drainage improvement	
	0	paved	good	acceptable		road upgrade ; drainage improvement	
Total	**30,6**						

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

The summary of existing road and stormwater infrastructure for all 16 sites is shown below:

Table 23: Surface summary

	Length (km)		
Surfacing	**Merafong City**	**Mining Towns**	**Totals**
Asphalt	709,21	221,1	930,31
Paving blocks	25,65	2	27,65
Concrete	0	13,8	13,8
Gravel	319,9	106,9	426,8
Total	**1054,76**	**343,8**	**1398,56**

The required remedial actions are tabled below for the roads.

Table 24: Road Condition Summary for 17 sites

SUMMARY

Type of Road	Length (km)	Type of surfacing	Current surface and Pavement condition	Current Stormwater management	Rating	Proposed Intervention	Percentage needing immediate intervention
Minor arterial	250,63	Asphalt	fair	acceptable		reseal; routine maintenance; partial pavement reconstruction; drainage improvement	52%
	2,7	Paving	good	acceptable		Drainage improvement	
Collector street	113,9	Gravel	bad	no drainage		road upgrade ; drainage improvement	
	11,8	Paving	fair	acceptable		Cleaning and surface improvement	
	239,3	Asphalt	Poor	poor		new surfacing and partial pavement reconstruction; drainage improvement	
Local streets	440,78	Asphalt	Poor	poor		new surfacing and partial pavement reconstruction; drainage improvement	
	10,8	Concrete	poor	poor		new surfacing and partial pavement reconstruction;	

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

						drainage improvement
	13,15	Paving	good	acceptable		Cleaning and surface improvement
	248,8	Gravel	Bad	no drainage		road upgrade ; drainage improvement
Total	**1398,56**					

Below is a table that gives a recommendation for prioritisation of the sites for the existing roads.

Table 25: Existing roads summaries under the direct responsibility of Merafong City LM

	Site	Length (km)					Percentage needing immediate intervention
		Asphalt	Gravel	Paving	Concrete	Totals	
1	**Khutsong**	147	165,3	7	0	307,5	87%
2	**Wedela**	41,1	1,3	6,25	0	48,65	61%
3	**Kokosi**	36,1	56,2	9,3	0	101,6	75%
4	**Fochville**	93,8	4,7	0	0	98,5	33%
5	**Greenspark**	16,5	1	2,1	0	19,6	36%
6	**Blybank**	31,9	64,9	1	0	97,8	66%
7	**Welverdiend**	37,73	6,5	0	0	44,23	68%
8	**Oberholzer**	98,4		0	0	98,4	50%
9	**Carletonville**	206,68	20	0	0	226,68	54%
	Totals	**709,21**	**319,9**	**25,65**	**0**	**1054,76**	

Table 26: Existing roads summaries under the direct responsibility of Various Mines

	Site	Length (km)					Percentage needing immediate intervention
		Asphalt	Gravel	Paving	Concrete	Totals	
1	**Elandsrand**	7,8	4	0	4,6	16,4	52%
2	**Elandsridge**	17,8	1,9	0	0	19,7	20%
3	**Blyvooruitzicht**	48,8	35	0	0	83,8	100%
4	**Deelkraal**	25,1	5,5	0	0	30,6	67%
5	**Doornfontein**	25	14	0	0	39	67%
6	**Letastsing**	18,6	3,3	0	1,2	23,1	19%
7	**Phomolong**	38	24,2	2	5	69,2	42%
8	**Western Deep Levels**	40	19	0	3	62	35%
	Totals	**221,1**	**106,9**	**2**	**13,8**	**343,8**	

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

The prioritisation scale is indicated below:

Table 27: Prioritisation Matrix

Prioritisation scale		
80-100%	1	Highest priority
60-79%	2	
40-69%	3	
20-39%	4	
0-19%	5	Lowest priority

The above prioritisation is for existing infrastructure and solely based on existing condition of the roads.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

5. PLANNED ECONOMIC DEVELOPMENT PROJECTS

MCLM through the Local Economic Development, Tourism and Rural Development Department has a number of lined up projects for MCLM. The planned projects have a potential of improving the livelihood of the residence in Merafong City. The projects will attract a lot of investors in the various towns. These economic development projects will be a centre of attraction for the different sections of the targeted townships. It is important that from an infrastructure's point of view plans are put in place to ensure that the projects are supported by a solid road network system as well as water and sanitation as well as electricity.

5.5. Economic Development Projects

Below is a list of projects that have been identified by the Economic Development section which can be considered for at this stage. The projects require funding for implementation.

Project Description	Targets /Target Groups:	Where	Road Length (km)	Budget for implementation of the	Source of Finance:	Potential Funders
1. Industrial Hive-Wedela Phase II		Wedela		R15 239 176,00	MIG Business Plan Approved (Funding unsecured)	
2. Farmer Out- grower	SMMEs	Along R501	2.8	R8 000 000,00	Secured	**Sibanye**
3. Nursery	SMMEs			R3 000 000,00	Secured	**Sibanye**
4. Blybank Market Square	SMMEs	Blybank		R1 300 000,00	Unsecured	
5. Construction of Merafong City Enterprise Development Centre-EDC	SMMEs			R5 000 000,00	Unsecured	
6. Khutsong Agricultural Small	SMMEs	Kuthsong		R5 000 000,00	Unsecured	
7. Nooitgedacht Commonage Farm – Provision of stock handling facilities, fencing and water per camp	Small Scale Farmers			R10 000 000,00	Unsecured	
8. Development of Commonage Farm in all areas of Merafong City	Small Scale Farmers			R5 000 000,00	Unsecured	
9. Khutsong South Market Square	Small scale farmers	Kuhutsong South		R4 800 000,00	Unsecured	

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

10. Development of Local Economic Development Strategy	SMMEs			R1 000 000,00	Unsecured	
11. Merafong Integrated Tourism Package- Pre-feasibility	Business Community			R1 000 000,00	Unsecured	
12. Refurbishment of Carletonville Business Hives	Community Members	Carletonville		R250 000,00	Unsecured	
13. Carletonville Market Avenue	SMMEs	Carletonville		R1 700 000,00	Unsecured	
14. Floriculture Park Pre-feasibility	SMMEs			R7 000 000,00	Unsecured	
15. Wedela Market	Community	Wedela		R4 500 000,00	Unsecured	
16. Heritage feasibility study Lepalong caves	SMMEs			R200 000,00	Operational (funding unsecured)	
17. Waste Recycler Nodes Feasibility	Community members			R500 000,00	Unsecured	
18. Land rehabilitation through agro-bioenergy	Community members			R12 000 000,00	Unsecured	
19. SMME Manufacturing Cluster	Community members			R15 000 000,00	Unsecured	
20. Refurbishment of Khutsong South Business Hive	SMMEs	Khutsong South		R800 000,00	Unsecured	
21. Refurbishment of Greenspark Industrial Hive	Community members	Greenspark		R800 000,00	Unsecured	
22. Township Tourism - Khutsong Township Food Market at Nxumalo Street	SMMEs	Khutsong		R3 000 000,00	Unsecured	
23. Development of Neighboring Shopping Centre	SMMEs			R15 000 000,00	Unsecured	
24. Township Automotive Hubs	Community members			R6 000 000,00	Unsecured	

The Department of Local Economic Development is the process of sourcing funding for the envisaged projects. In the meantime it is important to plan for the infrastructure for the various locations that will support the different developments.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

5.6. West Rand Special Economic Zone (SEZ)

A Special Economic Zone, commonly abbreviated as SEZ, is a designated geographical area within a country that is subject to unique economic regulations and incentives aimed at attracting both domestic and foreign investment.

These areas are strategically established to stimulate the following:

- economic activity and Economic Diversification
- encourage industrial development
- Enhanced Export Opportunities
- Improved Infrastructure
- foster innovation and job creation

Within SEZs, businesses often enjoy a favourable regulatory environment, tax benefits, customs advantages, and streamlined administrative procedures, all of which are designed to make investment and business operations more attractive. Special Economic Zones are powerful tools for the economic growth, job creation and industrial development worldwide. Merafong can certainly benefit from such an initiative.

The land that has been identified is located east of Carletonville in the indicated areas below:

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

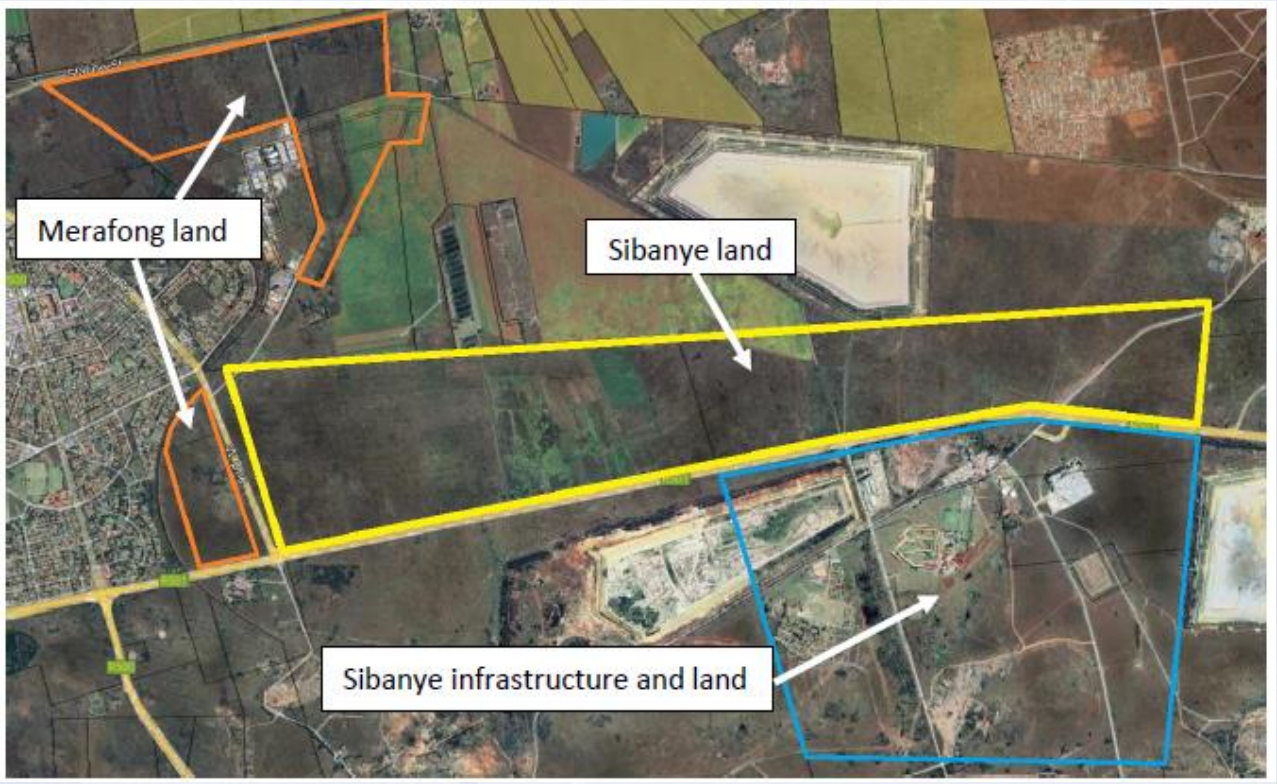


Figure 118: Location for proposed SEZ

The land is owned by Merafong City and Sibanye Stillwater. The land owned by Sibanye Stillwater is favourable and suitable as it would reduce the development cost significantly due to the infrastructure (in area marked in blue) that is already in place and ready for use after upgrading. The land size is about 1000Ha. The land can be used for industrial activities as well as agriculture (area marked in yellow).

The development of the SEZ would require infrastructure upgrading to support it. The investment into this initiative will improve the livelihood of the residence around Merafong City.

At this stage it is critical that the municipality plans for the required road network that will support the economic development. The proposed site runs along the regional road R501. This road is proposed for de-proclamation by MCLM if this SEZ is established. This will enhance revenue collection for the municipality through levies.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

6. INFRSRUCTURE IN LINE WITH HUMAN SETTLEMENTS

The Master Plan report has also considered the planned expansions and growth of all identified towns. Information was enquired from the Department of Human Settlement and sourced from the Human Settlement Plan 2024 /25 and the MSDF indicates that there are plans to extend some towns. The expansions of towns is in line with the backlog in meeting basic housing needs for the municipality. There is a number of informal settlements that need to be formalised. The rate at which the towns will grow is in line with economic development. Local residence are attracted to a particular area by the existing economic activities.

The Human Settlement and Housing Department has identified the following areas for extension in different towns:

- Khutsong South Extension 7
- Khutsong South Extension 5
- Khutsong South Extension 8
- Khutsong South Portion 123 Wonderfontein
- Khutsong South Re/Portion 43 of Welverdiend 97 IQ
- Elijah Barayi

The proposed sites are in Khutsong South are indicated below.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

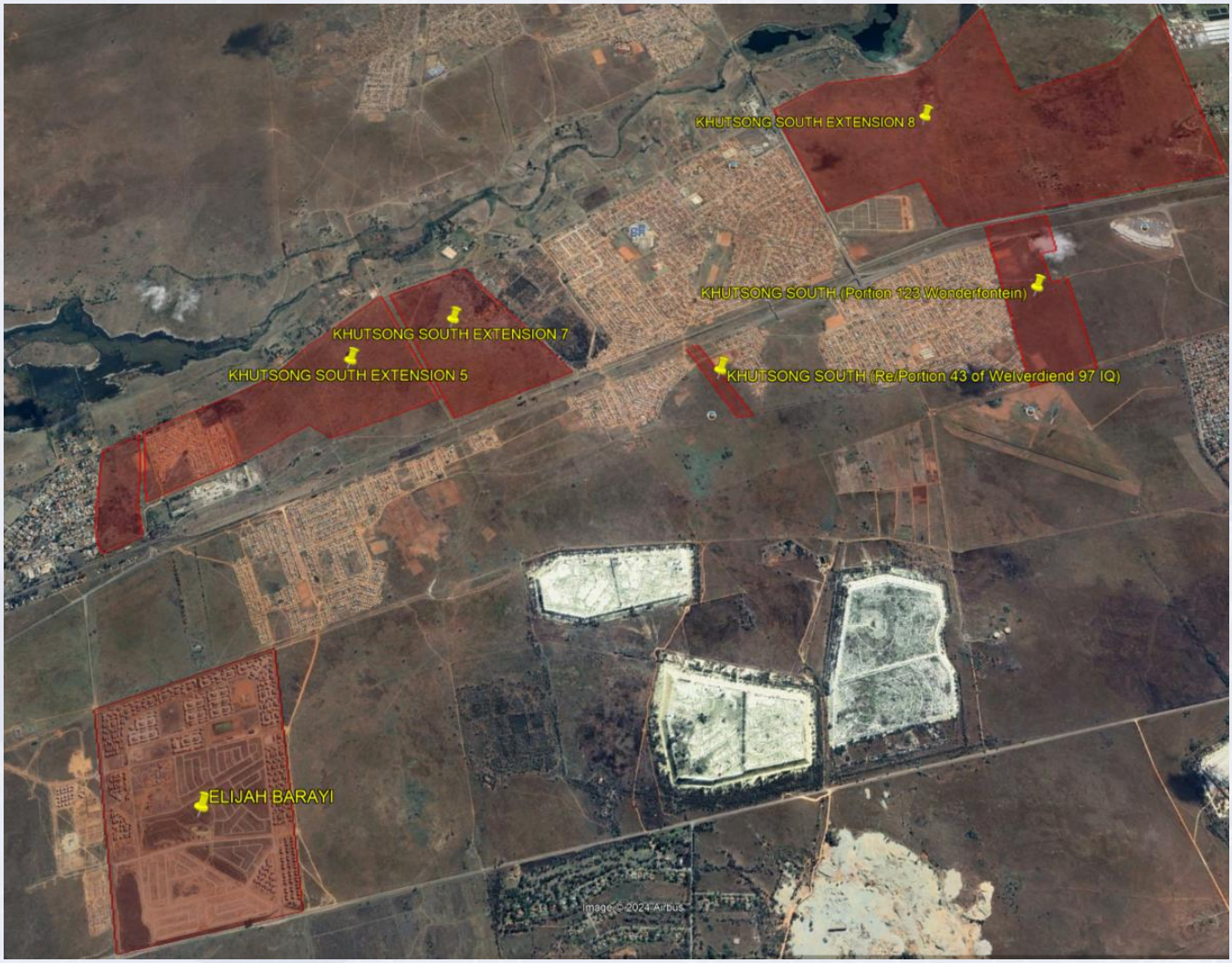


Figure 119: Northern region extensions

- Carletonville Ext 7 (To Be Viewed With Carletonville Bloubos)
- Carletonville Bloubos (To Be Viewed With Carletonville Ext 7)
- Proposed SEZ

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

The proposed sites are in and around Carletonville are indicated below.

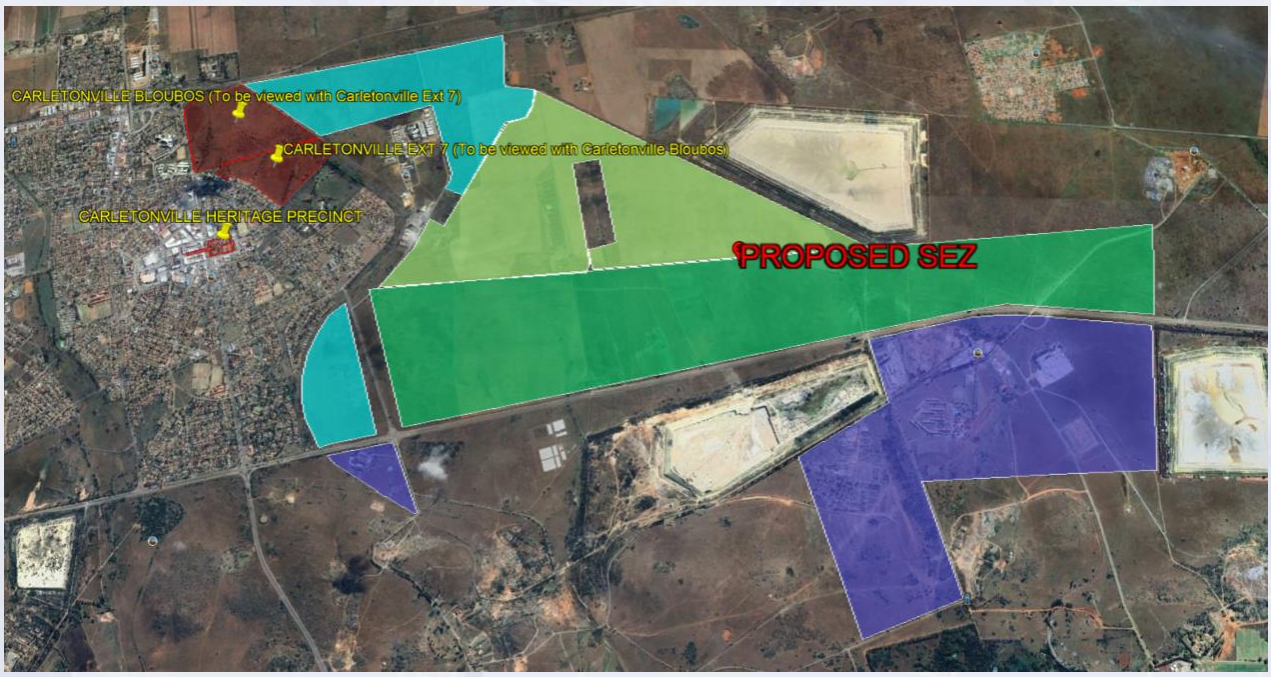


Figure 120: SEZ Proposed site

- West Wits Village Extension
- Wedela Extension 4
- Fochville Extension 7
- Fochville Central
- Fochville Public Works
- Kokosi Hub
- Erf 7241 & 7318 Kokosi Extension 6
- Kokosi Extension 7

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

The proposed sites are in Khutsong South are indicated below.

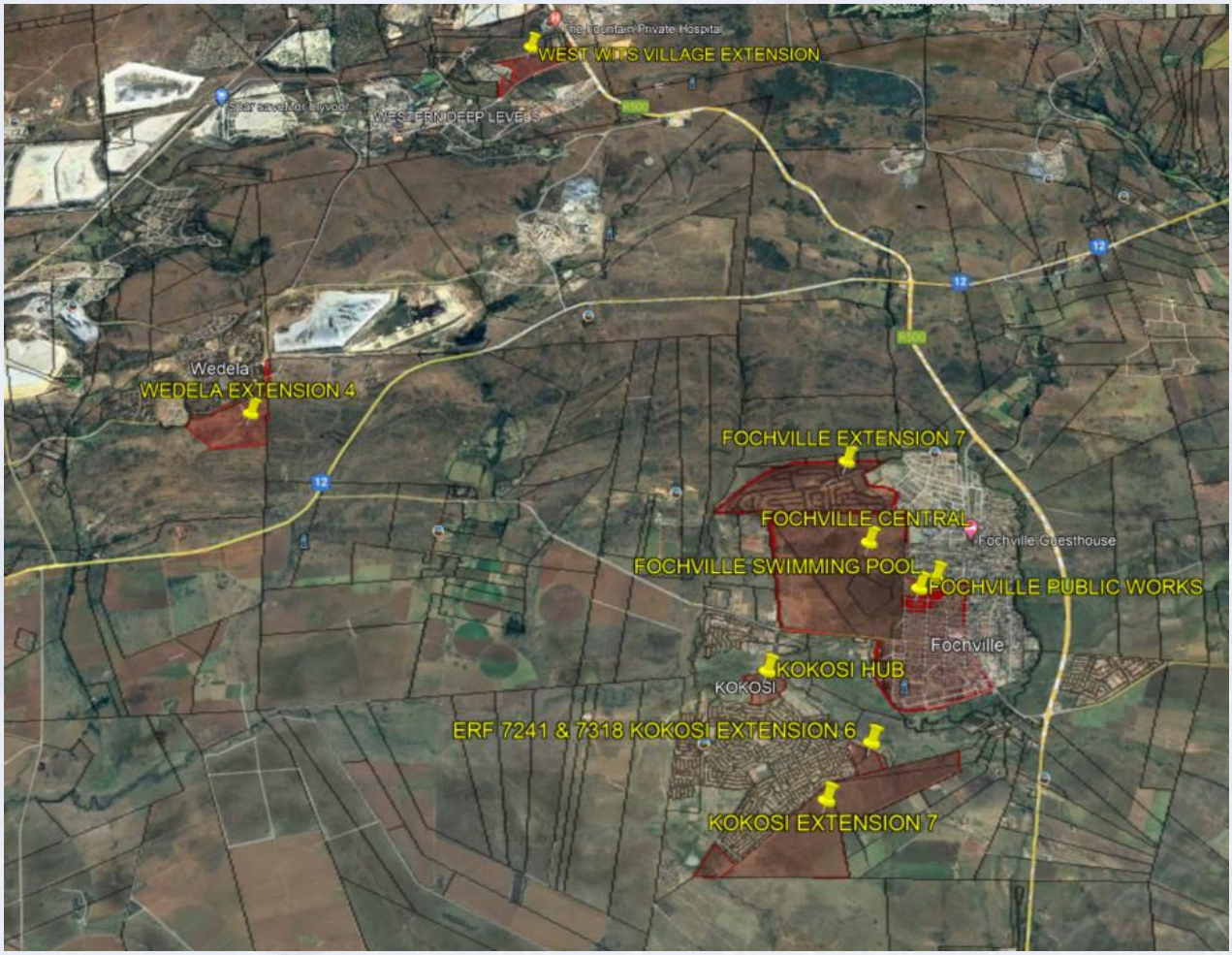


Figure 121: Southern belt as well as mining belt

The extension of the housing development will necessitate the construction of a significant road length of roads. The following are approximate length of road for each town.

Table 28: Proposed site Extensions length

Town	Extension	km
Carletonville	Central	9,0
Elijah Barayi		21,3
Western Deep Levels	West Wits Village Extension	8,0
Khutsong South	Extension 7	10,3
	Portion 123 Wonderfontein	6,1
	Re/Portion 43 of Welverdiend 97 IQ	1,5
	Extension 8	21,7
Carletonville	Ext 7	5,6
	Bloubos	7,5

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

	SEZ	35,0
	Heritage Precinct	0,2
Fochville	Swimming Pool	0,4
	Extension 7	14,5
	Central	11,0
	Public Works	0,9
Kokosi	Hub	1,6
	Extension 6	3,0
	Extension 7	26,3
Wedela	Extension 4	3,8
Blybank	Extension	32,0
Total		**243,5**

These plans have been included in the Master plan as servicing of areas planned for settlement should ideally come first before occupancy.

The road network should be prioritised once the locations and extensions have been approved for implementation. The total length of 243.5km is an approximate figure based on the given information as well as measurements done on Google earth.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

7. PROPOSED OF DE-PROCLAIMATION OF SOME REGIONAL ROADS

The following road sections of roads are recommended to be de-proclaimed due to their location and planned economic developments.

Table 29: Table of proposed de-proclaimed

Site	Road Location	Road name	Length (km)
Fochville	From N12 to Loopspruit road	R500	14,8
Carletonville	N12 to Blyvooruitzchit	R501	44
Western Deep Levels	N12 to R501	R500	23,6
Carletonville	R501 to Khutsong road	R501	21,8
Carletonville	new Carletonville Ext.7	P89/1	2,6
Fochville	Kokosi- Fochville	P149/1	2,7
Khutsong	Road links Khutsong main township with Carletonville	D2581	2,9
Khutsong south	link between Gauteng and North West provinces	D331	1.3
Elijah Barayi	D92(Between P111 and R501	D92	2,3
Khutsong South ext.6 & new Khutsong Ext.8	Between R500 and D331	D92	10,4
Total			**125,1**

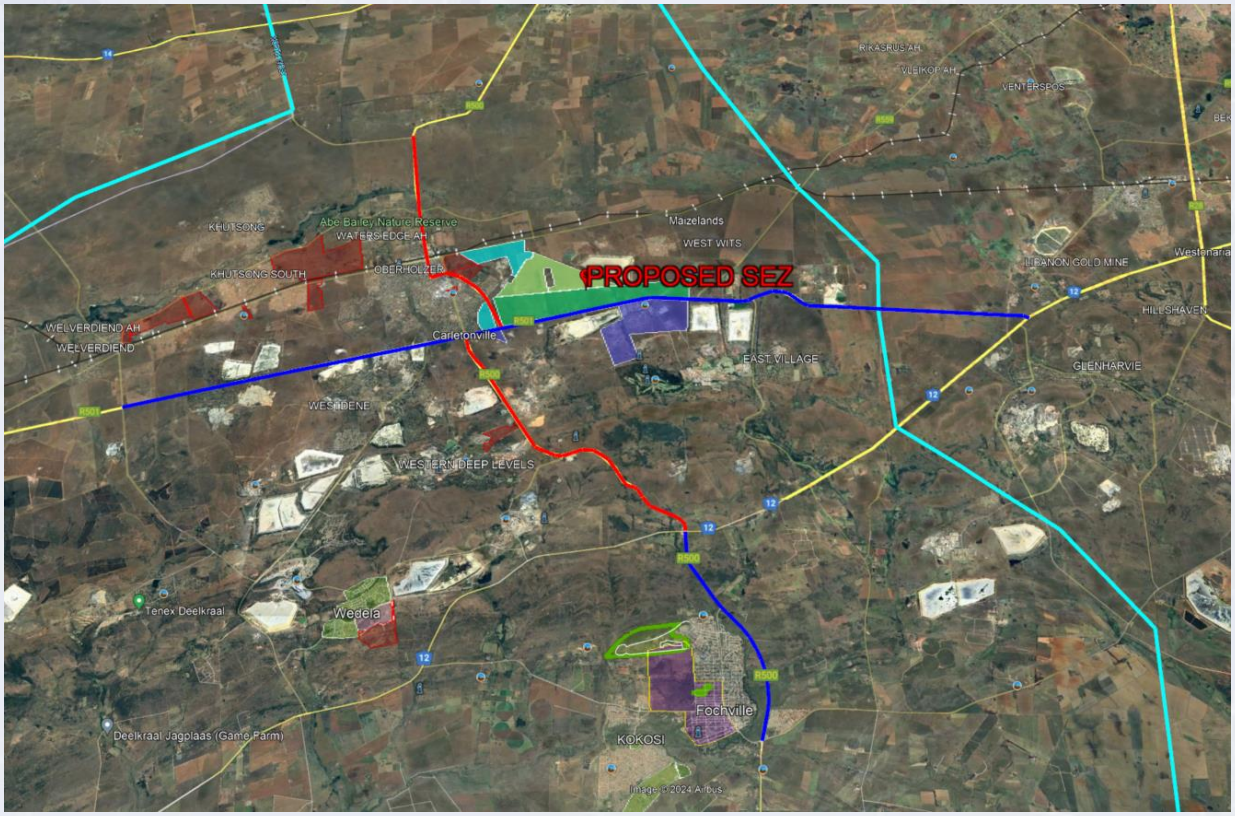


Figure 122: Locations for proposed de-proclaimed roads-Regional Roads

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

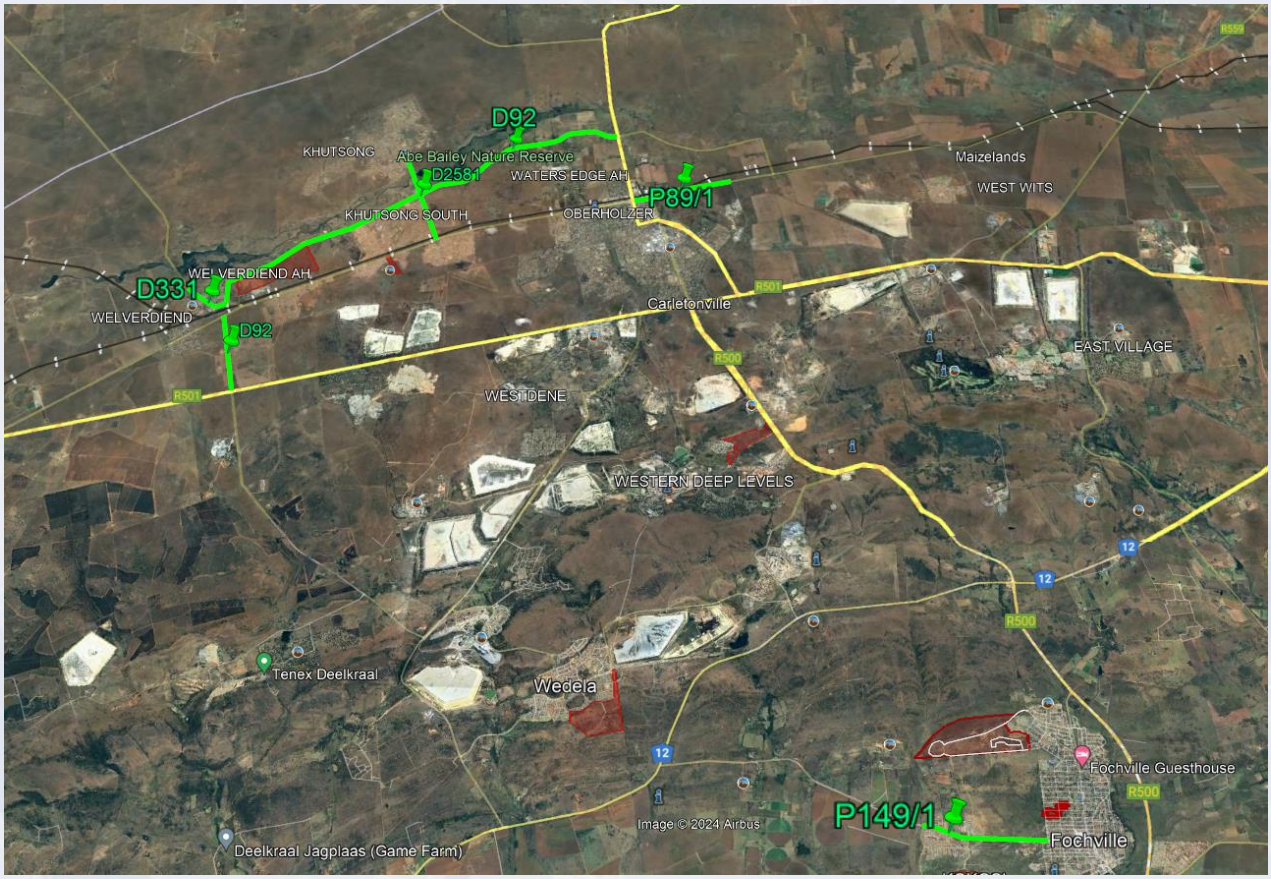


Figure 123: Locations for proposed de-proclaimed roads-Provincial Roads

Deproclamation of roads would increase the municipality's revenue collection.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

8. DESIGN APPROACH

Reference should be made to chapters 7 and 8 of the CSIR publication *Guidelines for Human Settlement Planning and Design* ("Red Book") for the consideration of all elements of design and construction of roads in the municipality. This should encompass geometric design options, construction materials and methods, as well as management of new and existing roads

The design approach and methodology to the project shall include carrying out investigations and testing of material so that the scope of work is well defined. The following criteria's will form part of the investigations:

8.1 Geotechnical Investigations

Geotechnical investigation shall be conducted in order to determine the current status of the existing pavement in order to come up with conclusive remedial measures. The expected deliverables should include but not limited to the following:

- Dynamic cone penetration test results;
- Line indicator tests and pavement layer thickness (where the pavement structure once existed);
- The moisture content, colour, consistency, structure, soil type classification and origin of in situ material;
- Report on the UCS for the treated layers;
- Existence of groundwater if encountered;
- Identification of suitable borrow pits preferably in proximity to the project site; and
- Overview of road failures, recommendations and treatment mechanisms.

8.2 Land Survey investigation

Topographical and cadastral surveys shall be utilised to determine the following;

- precise position of the road section under consideration;
- existing servitude;

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

- layout of the existing intersections;
- existing ground levels;
- cadastral boundaries;
- a river profile where the river crosses the road with a baseline extending 400m upstream and 200 downstream sufficiently wide to cover the drainage channel (20m each side of the river as a minimum); and
- Profile levelling along the riverbed.

The data collected will be utilised for the design of the geometric elements amongst Other things.

8.3 Traffic Investigation

No traffic counts have been conducted. The area that is under investigation consists of formal and in some instances informal roads. Any traffic data that has been done in the areas can be used to estimate expected vehicular movement and pattern. If none is available, then it will be proposed that at least some traffic studies be done at the entry point to each community or town.

8.4 Environmental Services

Environmental related investigations should be undertaken by specialists. In this regard, it should be taken into cognisance that the most roads under investigations are not new. It is possible that environmental authorisations are available. This should be availed for during detailed design in order to verify if there is need for amendments. The preservation of the environment during project implementation cannot be overemphasized. It is therefore expected that all designs take into consideration factors that can be detrimental to the environment. Mitigation measures will be put in place to ascertain that there is minimal or no impact to the environment. Therefore, the list of deliverables should include but not be limited to:

- Environmental Management Plan (EMP); and
- Environmental Authorisation

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

It is expected that an Environmental Management Plan will be submitted to the Department of Agriculture, Rural Development, Land and Environmental Affairs. Thereafter an Environmental Authorisation will be granted. The gravel required for construction will be obtained from approved borrow pits and water for construction will also be obtained from approved sources.

8.5 Occupational Health and Safety

It is expected that a specialist in Occupational Health and Safety (OHS) shall be appointed to monitor adherence of all OHS related matters during physical implementation of the project.

The monitoring and compliance of the Occupational Health and Safety regulations is the responsibility of the appointed Contracts Managers and Resident Engineers in terms of construction regulation 6(1) or 6(2). The following detailed regulations shall be in full force throughout the construction phase;

- Occupational Health and safety, Act No.85 of 1993;
- Minerals Act and Regulations, Act no.50 of 1991;
- Compensation for Occupational Injuries and Diseases, Act No.130 of 1993;
- Further standards that the Implementing Agent has included in the Contract;
- Mine Health and Safety, Act no.29 of 1996;
- Construction Regulations 2003; and
- Any other applicable statutory law.

The objective is to ensure that the appointed contractor comply with legislation and to preserve resources by way of safety, care of plant and minimization of waste of materials.

8.6 Social Facilitation

It has been proven through experience that for any given project there are social related matters that should be handled with utmost care to ensure project success. The livelihoods of communities in the vicinity of the project are either directly or indirectly affected. Social

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

facilitation services will thus be required throughout the project cycle since this project is passing through three (3) different communities. Therefore, a social facilitator will be appointed for the project.

8.7 Appropriate Legislation

The appropriate legislations for this project, during the planning, design, tender and procurement and construction stages, are as follows:

- Engineering Profession Act, 2000 (Act 46 of 2000);
- The Occupational Health and Safety (OHS) (Occupational Health and Safety Act 85 of 1993;
- National Environmental Management Act No.107 of 1998 (NEMA); Constitution of the Republic of South Africa Act No.107 of 1998;
- National Environmental Management Biodiversity Act No.10 of 2004; National Water Act ,1998 act No.36 of 1998;
- National Heritage Resources Act No.25 of 1999;
- Basic Conditions of Employment No.75 of 1997 (also covers EPWP);
- Compensation for Occupational Injuries and Health Diseases Act No.130 of 1993;
- The Broad Based Economic Empowerment Act of 2003 (Act No.53 of 2003); Labour Relations Act No.66 of 1995;
- The Construction Industry Development Board Act of 2000 (CIDB Act);
- The Preferential Procurement Policy Framework Act, 2000: Preferential Procurement Regulations ,2017 (Act No.5 of 2000);
- Deeds Registry Act, 1937 (Act No.47 of 1937); and Expropriation Act, 1975(Act No. 63 of 1975).

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

9. GEOMETRIC DESIGN

A design speed of 60km/h as an absolute maximum has been proposed for the purposes of determining values for the road geometric elements. This design speed will give steeper requirements for design which will be applicable safely for lower speed.

The following considerations were made in selecting the design speed;

- Safety - based on the road functions, it is expected that vehicles can operate safely within favourable traffic conditions at a design speed of 60km/h.
- Topography - which is described as ranging from flat to rolling and mountainous, will require lowering design speed to values such as 30km/h for built up areas with high volumes of human traffic.
- Anticipated operating speed
- Adjacent land use – the residential areas
- Functionality of roads as collectors and distributers
- Characteristics of the design vehicle i.e. range of vehicle types and the operating characteristics. The car will be utilised as the design vehicle for the horizontal and vertical alignment and the buses and heavy vehicles will be utilised for design of cross-sectional and intersection elements.
- Existing and future traffic demands

Other applicable design speed ranges that may be considered for the roads in Merafong City are tabled below. This will be considered for different scenarios along the different types of roads. Humps and lower speed signs shall be considered for roads that traverses through schools and other amenities. This will assist in enforcing driver alertness and increase safety for pedestrians.

Table 30: Road Classification and Design Speeds

ROAD CLASS	DESIGN SPEEDS (km/h)
ARTERIAL ROADS	**Urban**
Flat	50-100
Rolling	50-80
Mountainous	50-80

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

COLLECTOR/LOCAL ROADS	Urban
Flat	50-70
Rolling	30-70
Mountainous	30-50

9.1 Vertical

The general approach will be to design the vertical alignments in such a way that that the finished road level is above the natural ground level where the terrain is predominantly flat. A combination of parabolic curves and tangents will be utilised to achieve a smooth grade line. Consistency with the topography shall be maintained in order to ascertain that the design is economic as well. The following design element values shall be utilised for a design speed of 60km/h.

Table 31 Vertical alignment (Geometric elements values)

GEOMETRIC ELEMENT (Design speed 100km/h)	VALUE
Maximum gradient	6-8%
Minimum k-value (crest)	10-16
Minimum k-value (sag)	8-16
Minimum length of vertical curve	100m

The general finished level of the road would be made prouder than the natural ground level in order to allow storm water to drain off the road travel way minimising and avoiding hydroplaning which affect vehicle stability and steering. The finished road levels that are being proposed will necessitate that accesses within the built-up areas be improved to allow for accessibility of internal streets, private properties, schools, clinics, cemeteries etc.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

It is proposed that most of the gravel access be paved with block pavings using labour intensive methods and all concrete material be cast in-situ on site in an endeavour to create employment and alleviate poverty in the respective communities.

9.2 Horizontal

The necessary measures shall be taken to maintain the horizontal alignment where possible. The horizontal alignment elements in this instance are a combination of straights and circular curves whereby the radius and curve length are governed by the design speed. All effort will be made to ascertain that the proposed alignment is consistent, ensuring ease, comfort and safe operation of a vehicles. The following major elements shall been considered.

- Minimum radii
- Minimum curve length
- Maximum curve length
- Super-elevation

Table 32 Horizontal alignment (Geometric elements values)

GEOMETRIC ELEMENT (Design speed 60km/h)	VALUE
Minimum radius	110m
Minimum curve length	240m
Maximum rate of super-elevation (e_{max})	6%
Minimum length of super-elevation runoff	40m

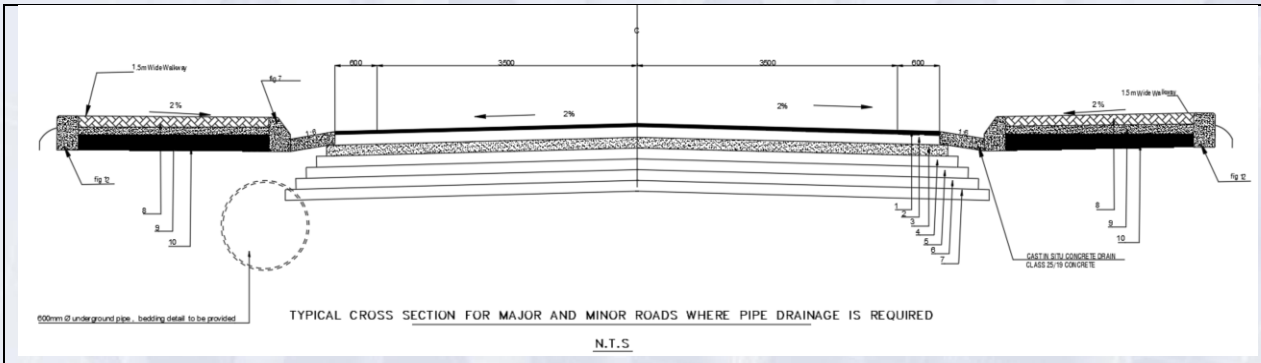
The design shall conform to the standard requirements however where design shortfalls will not be met the design speed shall be lowered and the introduction of humps and other speed detouring factors.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

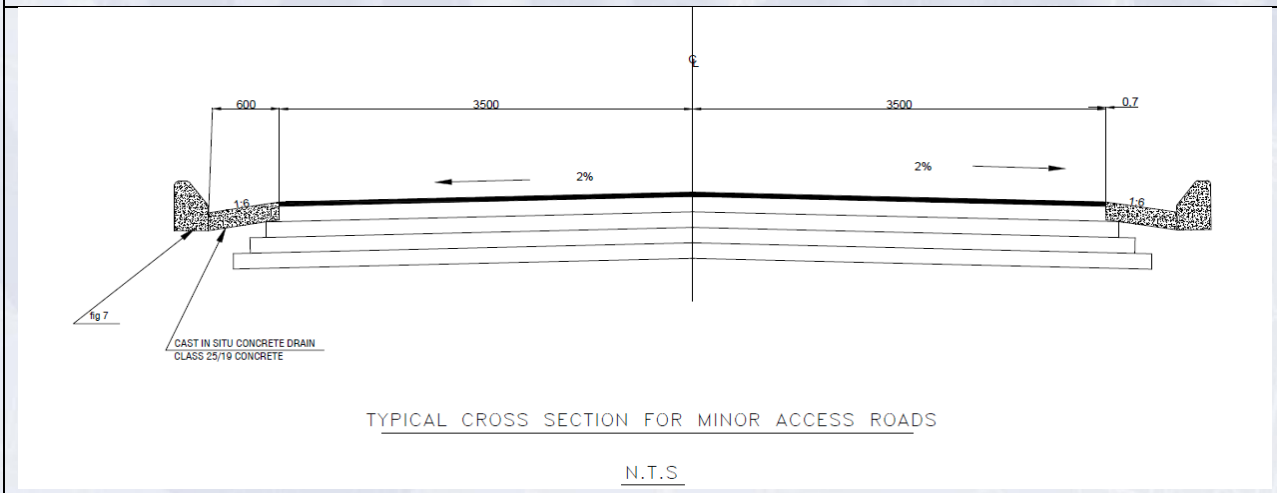
9.3 Cross sections

The roads to be considered will be of various cross sections. The following cross section will be utilised for various scenarios.



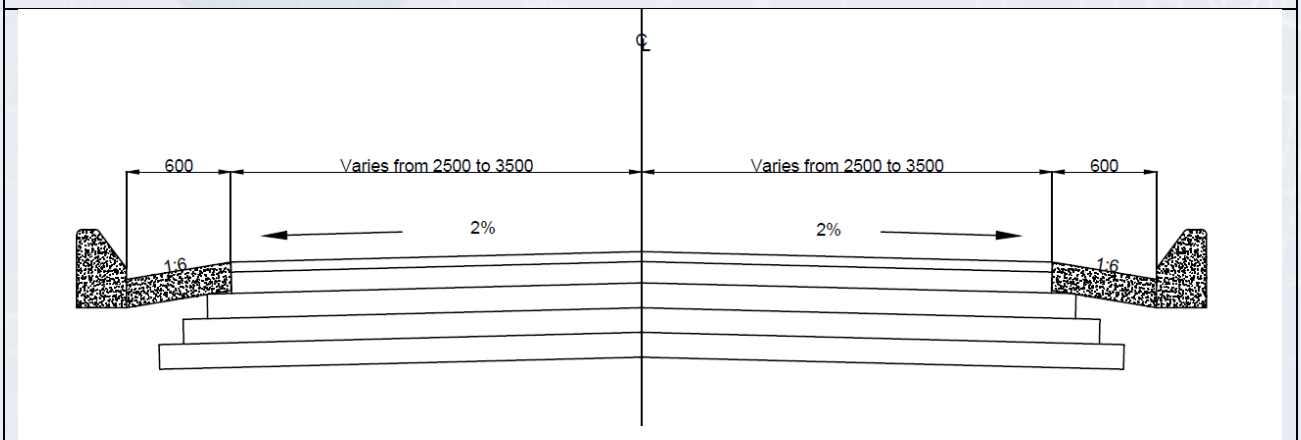
TYPICAL CROSS SECTION FOR MAJOR AND MINOR ROADS WHERE PIPE DRAINAGE IS REQUIRED

N.T.S



TYPICAL CROSS SECTION FOR MINOR ACCESS ROADS

N.T.S



TYPICAL CROSS SECTION FOR NARROW ACCESS ROADS

N.T.S

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

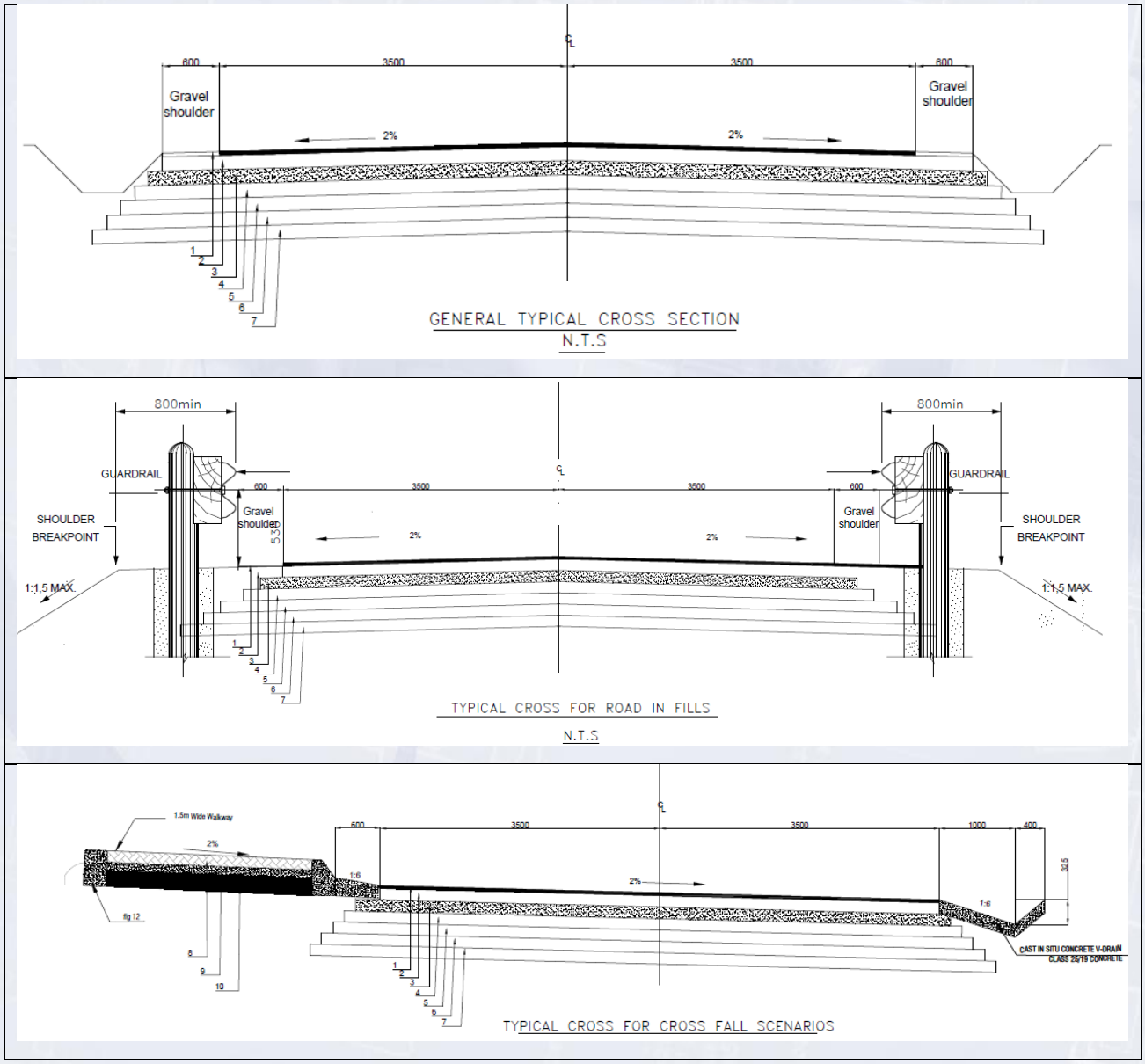


Figure 124: Typical Cross sections

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

PAVEMENT DESIGN				
LAYER NO.	DESCRIPTION	TRH 14 MATERIAL TYPE	SPECIFICATION	COMPACTION (% 0F MOD AASHTO)
1	30mm asphalt	Interlocking Paving blocks	80mm (type S-A), wet crushing strength >25 MPa	-
2	150mm BASE	G3	At least G6, E=1250MPa	-
3	150mm SUBBASE CEMENTED NATURAL GRAVEL (G6/G7)	C4	At least G6, E=1250MPa	-
4	150mm UPPER SELECTED LAYER	G7	Compacted to 95% Mod AASHTO, E=120MPa	95%
5	150mm LOWER SELECTED LAYER	G9	Compacted to 95% Mod AASHTO, E=70MPa	95%
6	FILL LAYER (Max 200mm)	G9	Compacted to 93% Mod AASHTO, E=70MPa	93%
7	SUBGRADE/INSITU (RIP AND RECOMPACT 150mm)	G10	Compacted to 93% Mod AASHTO ; E = 45 MPa	93%
8	WALKWAY : 60mm	Interlocking Paving blocks	60mm (type S-A), wet crushing strength >25 MPa	-
9	20mm CLEAN SAND WITH NO CLAY OR SILT MATERIAL	Bedding sand	Grading envelope ref (COLTO Clause 7302(a)	
10	150mm NEAT GRAVEL	G7	Compacted to 90% Mod AASHTO,	90%

Figure 125: Typical pavement layers

9.4 Pavement approach

The pavement design will be treated according to the recommendation from the envisaged geotechnical investigation. The investigation will give a highlight of the current pavement structures and the level of distress the pavement would have gone under. This in turn will assist in establishing the correct pavement design required.

The concept of preventive maintenance is encouraged. Preventive pavement management is about applying the right treatment to the right pavement at the right time. For preventive pavement management, it is critical to have a sound pavement management system in place.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

According to our visual assessment criteria, below is the proposed remedial actions that will be required for each condition.

Table 33: Pavement treatment for different assessment ratings

Rating	Description	Required action
Good	acceptable riding quality with minor defects	Routine maintenance which include; resealing; dealing with the exact defects independently. Ensuring road furniture and markings are defined. Walkways and shoulders improvement.
Fair	potholes; edge breaks; cracks on road surface; walkways overgrown with grass; pavement failures	Pothole patching; resealing; reworking the base Cleaning the walkways
Poor	distressed; potholes; edge breaks; cracked surface; numerous evidence of pavement failures; poor riding quality; no stormwater management	Pavement reconstruction by replacement of the pavement layers as required
Bad	unsafe for vehicles to travel on a road; gravel, extreme pavement failures; surfacing washed away; no stormwater drainage structures	Road reconstruction starting from roadbed.

At this stage the minimum recommended pavement structure for each type of road is as indicated below.

- surfacing – 30mm asphalt
- base - 150mm imported G3 compact to 97% MOD AASHTO
- subbase – 150mm imported C4 compact to 95% MOD AASHTO
- lower selected – 150mm G9 compact to 90% MOD AASHTO
- upper selected – 150mm G7 compact to 93% MOD AASHTO
- Roadbed – rip and compact G10 to 90% MOD AASHTO

The geotechnical investigation and Traffic Impact Assessment will determine the final pavement structure.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Rehabilitation of roads that have been proposed for de-proclaimation would require a minimum of the following road layer works:

Table 34: Layer works for de-proclaimed roads

	depth	Material
Road layerworks	30mm surface	asphalt
	150mm base	G1
	150mm subbase	C4
	150mm upper selected	G5
	150mm lower selected	G6
	200mm roadbed	G8 or better

The level of rehabilitation will be advised by the Traffic studies and geotechnical investigations. The road width will be approximately 12.5m.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

10. PRIORITIES OF EXISTING INFRASTRUCTURE

Priority should be given to maintenance of existing assets before any new work is undertaken. This means repair or reconstruction of surfaced roads in order to reinstate them to a good condition, and regravelling and reshaping of gravel and dirt roads. The latter is especially important for efficient stormwater drainage to take place, and to control erosion. A well- constructed and well-maintained gravel road provides a good level of service.

In order to carry out this work departmentally, the municipality will need to purchase various items of construction equipment, and also employ sufficient trained personnel to operate them. Minimum equipment will be a grader, a self-propelled roller, a hand-operated roller, a loader, a TLB and at least three tipper trucks, as well as a number of general workers. A concrete mixer should also be provided. Well-situated gravel borrow pits are essential.

Consideration can also be given to outsourcing the work, as this will obviate the problem of lack of trained operators. General labourers, however, should be drawn from the nearby communities in order to create local work opportunities. Outsourcing the maintenance of roads should be done on a yearly basis in order to provide continuity and to avoid regular protracted procurement procedures.

Maintenance and reconstruction work should target main access and transport routes first, followed by local streets. Consulting engineers should be appointed to carry out initial investigative work and to provide plans and specifications. They should also develop a full PMS and assist the municipality to implement it.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

11. BACKLOGS AND FUTURE DELIVERY REQUIREMENTS

11.5. Community infrastructure needs and policy options

There are areas within MCLM that do not have an acceptable level of service of roads infrastructure. Decisions regarding infrastructure development must be made within the framework of the IDP and the available resources. This should start with providing some of the informal settlement residence with descent housing. The appropriate service levels should be selected and questions must be asked about affordability and sustainability. Infrastructure development has ongoing cost implications for municipalities and different infrastructure assets can have varying cost implications depending on the level of service. External funding is often available for infrastructure development, but ongoing operating and maintenance costs must be paid from the municipal budget.

Different policy options should be considered when deciding on infrastructure development, for example:

- Basic level of service : Graded
- Intermediate level of service : Gravelled
- Full level of service : Paved with kerbs.

11.6. Community involvement

All infrastructure programs are important, but some may be more urgent than others. For example, water and proper sanitation facilities are basic needs, and may be more important for a community than improving the roads or stormwater drainage. It is important to involve the community in setting the priorities and to keep communication channels such as ward committee meetings open and transparent in order to properly discuss programme and priorities. In this manner, ownership of the infrastructure is taken by the communities.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Awareness is also created about available financial resources, thus projects can be prioritized.

Service level is a concept used to describe the level of infrastructure provision. Within MCLM the long term goal is to provide all citizens with the same level of service, irrespective of property value or levels of rates and taxes being paid. Due to imbalances inherited from the past, however, this will not be possible for the foreseeable future. As an interim measure, minimum levels of service should be adopted. In the prioritisation of projects, cognisance should be taken of wards where minimum service levels are not being met, and these should enjoy preference. Backlogs in terms of service levels, therefore, form part of the prioritisation method proposed.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

12. STORMWATER INFASTRUCTURE

12.1. General

Effective stormwater management provides environmental, social, and economic benefits to local communities. When stormwater management is done well, streams, rivers, and lakes are cleaner; flood risks are reduced; costs due to flood damage decrease; and community quality of life increases.

When cities grow and further development takes place, stormwater runoff increases. Stormwater flows from concrete, asphalt, rooftops, and other surfaces designed to shed water and rapidly funnel it toward storm drainage systems. By removing natural grass veld and replacing this with impermeable roofs or less permeable surfaces, the stormwater runoff properties are significantly altered. The construction of conduits and canalization of natural watercourses routes the runoff of stormwater more effectively through a developed area, but at a greater velocity and in greater volumes than previously experienced in these catchment areas.

By altering the natural stormwater flow properties, a need arises for stormwater management while minimising the negative impacts of development.

In Clause 19 of the National Water Act (Act 36 of 1998) the prohibition of pollution is addressed. Of note here is that if pollution of a water resource occurs or might result from activities on land, the person who controls, occupies or uses the land in question is responsible for taking measures to prevent pollution of water resources.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

12.2. Objectives

The objectives of the abbreviated Stormwater Master Plan are:

- A status quo evaluation of the stormwater systems already in place;
- an engineering determination of the required elements of stormwater systems; and
- a prioritization of projects required to manage, complete and maintain the stormwater scheme(s) in the short, medium and long term.

In terms of planning hierarchy, a Stormwater Master Plan fits in between a Catchment and River Management Plan and a Local Stormwater Plan. In practice, a Stormwater Master Plan concerns the functioning of bulk infrastructure within a catchment, and includes implementation tasks and schedules. However, it is difficult to determine implementation details in advance, as many variables are involved.

12.3. Stormwater management

This entails provision of stormwater management to safely discharge runoff into natural environment. The existing informal roads serves as open drain when it is raining but with no proper storm-water management. The storm-water runoff affects the traffic-carrying capacity of the streets through:

- Sheet flow across the road surface
- Channel flow along the road
- Ponding of runoff on road
- Flow across traffic lanes

The drainage system of the residential area and the road is of sub- standard. There is minimal provision made to drain runoff more efficiently, hence soil erosion.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

12.4. Scope of works

The scope of works will include, inter alia, the resealing of the existing deteriorated roads, pavement reconstruction, upgrading from gravel to surface of the existing road and provision of storm-water management to safely discharge runoff into natural environment.

The project scope will includes but not limited to:

- Site Establishment, Clear and Grubbing
- Earthworks and Pavement Layers – Roadbed, Subbase and base
- Construction of concrete drifts, and concrete site drains
- Construction of mountable concrete kerbs
- Construction of concrete lined edge beam
- Paving with 80mm bricks for road ways and 60mm bricks for walkways
- Installation of portal precast concrete pipe culverts with guardrails, gabions and wing walls

12.5. Expanded Public Works Programme (EPWP) Aspects

The projects will accommodate the EPWP programme. The design and construction method will incorporate the following labour intensive activities:

- construction of paving blocks as surfacing
- Construction of kerbing
- Construction of drainage structures
- Excavation on non-critical areas as well as the backfill operation

12.6. Purpose of stormwater management

The principles on which stormwater management is based are as follows:

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

- The need to protect the health, welfare and safety of the public and to protect property from flood hazards by safely routing and discharging stormwater;
- the quest to improve the quality of life of affected communities;
- the opportunity to conserve water and make it available to the public for beneficial uses;
- the responsibility to preserve the natural environment;
- the need to strive for a sustainable environment while pursuing economic development;
- the desire to provide optimum methods of controlling runoff in such a way that the main beneficiaries pay in accordance with their potential benefits;
- the need to ensure that artificial loading on wastewater treatment works (WWTW) is minimized; and
- the need to minimize the influence of fecal contamination in stormwater runoff.
- While these goals may be reflected in other disciplines – and indeed may even be in apparent conflict with one another – specific objectives supporting these overall goals need to be identified by the planning team for each particular project.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

13. VISUAL ASSESSMENT

13.1. Status quo evaluation

Merafong City does not currently have a Stormwater Bylaw or Stormwater Management Policy in place. It is recommended that such documents be compiled for reference.

Besides piped drainage, the various towns and townships rely to a large extent on surface drainage of stormwater, by means of roads and additional infrastructure such as unlined and lined channels.

The stormwater infrastructure can best be described as aged. In a number of cases capacity problems are also experienced, due in large part to accumulation of debris in the pipes and surface drains. This debris (gravel, silt, refuse, etc.) should be removed in order that the stormwater systems can function efficiently.

In some cases culverts crossing the roads have collapsed.

The major stormwater risks for MCLM have been identified as follows:

- Stormwater bylaws and stormwater management policies not in place;
- stormwater ingression at sewer pipes;
- stormwater conduits and surface drains are obstructed or cannot handle the runoff;
- erosion;
- ponding takes place in streets, resulting in inaccessibility and damage to road surfaces;
- flooding takes place, which results in damage to property, and which also poses a risk of injury or loss of life;
- stormwater from domestic property being channeled into sewer gullies in many cases; and
- Sewage overflows and enters the stormwater system or natural resources, resulting in environmental pollution.

Stormwater visual assessment pictures were already covered under roads.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

14. STORMWATER SYSTEMS AND STRATEGY

14.1. General

Property developers, whether private or municipal, need to take heed of the important role they play in stormwater management. For example, a typical local authority requirement for new developments is that peak runoff must be reduced to pre-development levels before being released into the downstream infrastructure. The principle that developers must manage their own stormwater is generally accepted as reasonable.

Traditionally, runoff from frequent (minor) storms has been carried in the urban formal drainage systems. Typically this was achieved by draining runoff from properties onto the streets and then via conduits to the natural watercourses. The system was intended to accommodate frequent storms and associated runoff. Today, the value of property is of such significance that engineers need to consider not only the frequent storms but the more severe storms as well, which can cause major damage with sometimes catastrophic consequences. The dual system incorporates a *minor system* for the frequent storm events and a *major system* for the less frequent but severe storm events. The major system may include conduits and natural or artificial channels, but may also make use of the road system to convey runoff overland to suitable points of discharge. This is not very different from what has happened *de facto* except that formal recognition is now given to the routing of runoff from all storms via the secondary use of roads and other facilities in the urban environment.

During minor storm events the two functions of urban roads, namely the function of carrying vehicular, cycle and pedestrian traffic and the function of stormwater management, should not be in conflict. During major storm events the traffic function will be interrupted and the flood control function becomes more important as the roads will also act as channels. It is, however, important to acknowledge that during major storm events it is still important to be able to render emergency services, and major roadways and bus routes should therefore be designed to accommodate vehicular traffic in these instances.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

A good road layout can substantially reduce the cost of the stormwater system, and thus also road maintenance costs.

Because MCLM will for a number of years have a substantial length of gravel roads and gravel developing areas, the stormwater contributions from these areas will carry a large amount of grit that will quickly silt up and reduce the efficiency of open channels and underground stormwater conduits or even render the network useless. Use of pipelines in high-erosion environments is not recommended for this reason. This means that the design of even the minor stormwater systems should rather take into consideration the use of lined, above-ground stormwater channels in the short and medium term. Once funds become available for road surfacing and the extensive development of large areas has taken place, then the gradual phasing-in of underground stormwater conduits will be possible and preferable.

Roads with steep gradients should, as far as possible, not be used as drainage ways, nor should any adjacent side-drain be constructed without proper erosion protection. This protection can include drop structures, lining, or regular drainage from the roadway into intersecting roads or drainage ways.

Where the whole roadway is used as a drainage way for the major system, erosion protection on the lower road edge may need to be considered. The crossfall of the road should generally be against the natural ground slope so that the whole road width can act as a drainage way in the major system. To maximize the storage function of roads as part of the drainage system in major storm events, the township layout should be planned so that the greatest length of road closely follows the ground contour (the contour-planning concept).

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

15. DESIGN CONSIDERATION

The road stormwater drainage is mainly through kerb channel drains and stormwater pipes on major and minor access roads as well as undefined V-drains which follows the geometric alignment of roads. At the low points stormwater is captured using 600mm concrete pipes and delighted across.

Surface drainage on the road will be different based on the location and scenario as follows:

- High Fills: Surface drainage will be through the normal cambered road slopes or in cross fall with water intercepted by a combination of kerb inlets and down chutes.
- Cuttings: earth or concrete lined drains will be constructed at cuttings and decision to make the drains earth or concrete lined depends on the steepness of the slopes.
- Deep Cuttings: Catch drains and berms will be constructed at high cut areas

15.1.1. Design Codes and Standards

The following design codes and standards shall be used for the storm water design:

Table 35: Proposed Storm water Design Standards

Design Parameter	Value	Design Manual/Standard
Minimum Pipe size	600mm diameter	Drainage Manual, SANRAL, 6th Edition, 2013
Minimum drain pipe class	100D	Drainage Manual, SANRAL, 6th Edition, 2013
Soil type :	Class C	Drainage Manual, SANRAL, 6th Edition, 2013
Minimum velocity	0.9 - 1.5m/s	Human Settlement Planning and Design (Redbook)-page 26
grade for 600 dia. pipe	1:200	Human Settlement Planning and Design (Redbook)-page 27
Maximum manhole spacing	100m, adopt 60m	Human Settlement Planning and Design (Redbook)-page 32
Annual Precipitation	48.50mm	Drainage Manual, SANRAL, 6th Edition, 2013
Return period	20 or 50 years	Drainage Manual, SANRAL, 6th Edition, 2013

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

15.1.2. Hydraulic analysis and modelling

The hydraulic analysis and modelling procedures shall be utilised to determine the design flood peaks for the hydraulic structures and specific return periods. This exercise will be carried out for the purposes of upgrading and rehabilitating the drainage system for road all roads. Different catchment areas will be considered for the different roads.

The expected runoff from the catchment area and the road reserve will be computed, taking into account the flood hydrology of the area. The factors that will be considered due to their effect on runoff are;

- topographical factors
- antecedent soil moisture conditions
- developmental influences and
- Climatological variables.

The 1:20 year and 1:50 year return period will be considered at *this stage*. This is meant to analyse and compare the peak flows. The capacity of the major and minor culverts will be checked to ensure adequacy.

The Rational Method will be utilised to calculate the peak flows for the purposes of sizing the drainage structures and analysis of optimum functionality of the existing structures. The method has no limitations and can be utilised for areas smaller than 15km^2. The representative percentage run-off coefficients and rainfall are unique to each drainage basin.

$$Q = \frac{CIA}{3,6}$$

where:

Q	=	peak flow (m^3/s)
C	=	run-off coefficient (dimensionless)
I	=	average rainfall intensity over catchment (mm/hour)
A	=	effective area of catchment (km^2)
3,6	=	conversion factor

Figure 126: Rational formula

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Return periods of 1:20 and 1:50 shall be utilised for analysis purposes only. Based on the road classification and the possibilities of future developments a return period of 1:20 years will be utilised for design purposes.

The following shall be determined form the 1:50 000 maps

- Catchment area
- Length of main channel
- Average slope of the catchment area

The Table 36 below shows topographic characteristics for one road used for calculation purposes only.

Table 36: Topographic Characteristics

	Characteristic	Parameter
1	Catchment Area (km^2)	2.25
2	Highest point in Catchment (masl)	1267.77
3	Height at Catchment Outlet (masl)	1280.50
4	Maximum Height difference, H_{max} (m)	12.73
5	Length of longest watercourse, L (km)	1.50
6	Average Slope, S_{avg} (m/m)	0.017
7	Concentration Time T_c (hours)	0.45

Manning's Formula was utilised to determine the hydraulic sizes of the drainage structures.

$$Q = \frac{1}{n} \frac{A^{\frac{5}{3}}}{P^{\frac{2}{3}}} \sqrt{S}$$

Figure 127: Manning's Formula

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

The peak flow will be computed based on the elements listed Figure 128 Coefficient of runoff.

Rural (C_1)					Urban (C_2)	
Component	Classification	Mean annual rainfall (mm) < 600	600 - 900	> 900	Use	Factor
Surface slope (C_s)	Vleis and pans (<3%)	0,01	0,03	0,05	*Lawns*	
	Flat areas (3 to 10%)	0,06	0,08	0,11	- Sandy, flat (<2%)	0,05 - 0,10
	Hilly (10 to 30%)	0,12	0,16	0,20	- Sandy, steep (>7%)	0,15 – 0,20
	Steep areas (>30%)	0,22	0,26	0,30	- Heavy soil, flat (<2%)	0,13 – 0,17
					- Heavy soil, steep (>7%)	0,25 – 0,35
Permeability (C_p)	Very permeable	0,03	0,04	0,05	*Residential areas*	
	Permeable	0,06	0,08	0,10	- Houses	0,30 – 0,50
	Semi-permeable	0,12	0,16	0,20	- Flats	0,50 – 0,70
	Impermeable	0,21	0,26	0,30		
					Industry	
					- Light industry	0,50 – 0,80
	Thick bush and plantation	0,03	0,04	0,05	- Heavy industry	0,60 – 0,90
Vegetation (C_v)	Light bush and farm lands	0,07	0,11	0,15	*Business*	
					- City centre	0,70 – 0,95
	Grasslands	0,17	0,21	0,25	- Suburban	0,50 – 0,70
	No vegetation	0,26	0,28	0,30	- Streets	0,70 – 0,95
					- Maximum flood	1,00

Figure 128 Coefficient of runoff

15.1.3. Proposed drainage and implications

The following remedial actions will be undertaken;

- Construction of earth side drains would be employed located beyond the shoulder breakpoint parallel to the centre line of the road. This will be implemented for Major roads where there is no limitation to space.
- Provision of lined side drains preferably stone pitched in order to create work opportunities aligned to labour intensive construction. Lined side drain will be provided on the lower side of an existing horizontal curve.
- Kerb channel combinations will be provided where walkways will be provided.
- Banks (earth berms) will be reconstructed to intercept storm water and prevent it from collecting into the travel way.
- Subsurface drainage will be introduced where the moisture regimes are high.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Subsurface drains may be provided where necessary.

- Replacing the damaged pipe culverts with the new ones of similar or higher capacity and suitable inlet and outlet structures which include wing walls, headwalls and aprons.

15.1.4. New proposed drainage structures

15.2.4.1. Relief culverts

New relief culverts will be constructed in order to assist with interception of storm water drainage from the road and side drains. The minimum diameter of the relief pipe culverts shall be 600mm.

15.2.4.2. Access culverts

Accessibility to existing properties will be dependent on the finished road levels. This is depended on the vertical alignment.

15.2.4.3. Side Drains, Edge Drains and Erosion Protection

Stormwater will also be managed through a number of ways depending on the section which the road is traversing in relation to the slope of the ground. Storm water will be conveyed in the following ways;

- Concrete/stone pitched lined side drains
- Edge drains
- Trapezoidal shaped open surface drains
- Lined concrete chutes on fills

The desirable minimum velocity would be 0.6 m/s in order to prevent silting. The design return period for all storm water structures will be 1:20 and 1:50 years.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

16. ASSET MANAGEMENT

One of the important issues identified, as in the roads master plan above, is the lack of proper asset management programmes. This will inevitably lead to the deterioration of the infrastructure and poor service provision. It is therefore of cardinal importance that asset management programme be initiated as a matter of urgency. In all catchments, the watercourses and built stormwater infrastructure should be maintained in a clean state, free of any rubbish, debris and other matter likely to pose a pollution threat to the lower reaches of the watercourses.

No stormwater network can function optimally if the infrastructure is not maintained regularly. This requires adequate funds to be allocated to the maintenance budget. Maintenance is of particular importance in areas where there are no overland escape routes to carry surplus runoff when the underground system fails, such as kerb inlets, pipe conduits and box culverts. As described above, the general approach to urban stormwater management in South Africa is to accommodate minor events in the underground pipe network and to route the surplus runoff from major events overland – typically via the road network.

Since good stormwater drainage and proper road construction are complementary and inseparable, reference should be made to sections above.

It is proposed that, as far as possible, stormwater drainage be facilitated by the use of open channels, as these are seen to work well where they have been implemented. Only road crossings should be piped underground. Channels should be constructed and shaped integrally with the roads in order to derive full benefit. It is recommended that channels be lined in order to facilitate efficient drainage and to reduce maintenance. Priority should be given to improving the drainage in the townships where gravel roads, poor drainage conditions and erosion is predominant.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

17. MUNICIPAL FUNDING

Each municipality is responsible for; (a) structuring and managing its administration and budgeting and planning processes to give priority to the basic needs of the community, and to promote the social and economic development of the community; and (b) participate in national and provincial development programmes. Spending and income play an important role in determining a municipality's ability to deliver services. The municipality is required to generate its own income is a sign of its independence.

The Quarterly Financial Statistics of Municipalities (QFSM) survey collects data on municipal operating expenditures and incomes on a quarterly basis. The December 2018 release, for the period 1 October 2018 to 31 December 2018, offers insights into the breakdown of municipal income.

Municipalities obtain their income from many different sources which can be broadly grouped into two main categories, **namely income generated by the municipality itself**, **and fiscal transfers from other spheres of government,** often referred to as grants and subsidies.

17.1. Income generated by the municipality itself

A municipality can generate its own income via

- Property rates, service charges. Property rates are sourced from owners of land, homes, buildings or businesses. The amounts levied by municipalities for property rates are generally based on the value of the property. Municipalities also make use of charges that are levied on services such as water, electricity, sanitation and refuse removal. Municipalities also sometimes charge users for the use of their facilities, such as sports grounds and recreation centers.

- Fines. Fines and penalties are another source of internally-generated income. These include, among others, traffic fines, penalties for contraventions of by-laws, and penalties for overdue payments of services.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

17.2. Fiscal transfers from other spheres of government

The municipality, also gets income from other spheres of government in the form of grants and subsidies as well as donations made by the public to municipalities.

Grants are fiscal transfers, often from national government, that usually do not have to be repaid but often come with the condition that they are used for defined or specific purposes. The Municipal Infrastructure Grant (MIG) is an example of a conditional grant that is given to municipalities with the specific condition that those funds are used for maintaining infrastructure, such as roads, pipes, and wastewater treatment plants.

Unconditional grants, on the other hand, are allocations that can be used for a variety of purposes. How the unconditional grant is used is left to the discretion of the municipality, according to its own needs. The equitable share is an example of an unconditional grant that a municipality can use for purposes that fall outside the scope of improving basic services, such as spending on administration.

The December 2018 QFSM indicates that municipalities in South Africa generate, in total, 72% of their own income. The remaining incomes are transfers from national and provincial government as well as voluntary donations from public constituencies.

There are, however, significant differences between income sources for municipalities. For instance, metropolitan councils generate, on average, 83% of income themselves. District municipalities and local municipalities, in contrast, raise only 18% and 64% of income from their own sources, respectively.

The major source of income for all municipalities in the country is service charges (42%), which is a combination of water and electricity sales, sewerage and sanitation and refuse removal charges. Service charges are followed by grants and subsidies (28%), property rates (18%), and other income (12%) which, amongst other things, consist of fines,

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

licences and permits, gains on disposal of property, plant and equipment, public contributions and donations.

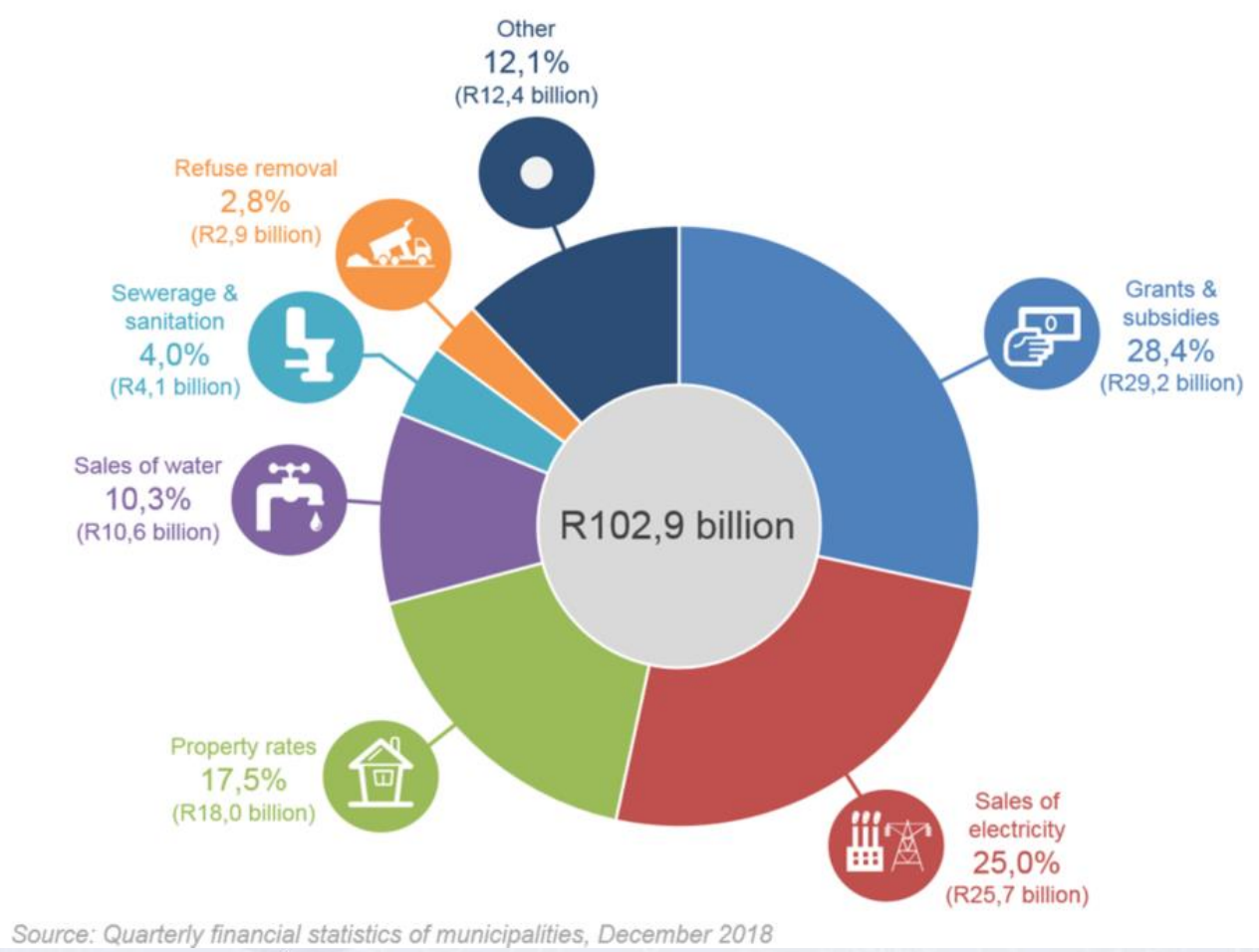


Figure 129: 2018 Municipal Revenue summary

There are a number of grants that the municipalities can tap into for infrastructure funding. Below are extract from the 2024 Division of Revenue Bill. The following are allocations that MCLM can safely tap into from the national to the local level.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Spheres of Government	Column A	Column B	
	2024/25	Forward Estimates	
		2025/26	2026/27
	R'000	R'000	R'000
National[1,2]	1 434 313 321	1 522 047 226	1 606 856 491
Provincial	600 475 640	627 441 853	655 704 215
Local	101 177 734	106 087 022	110 661 361
TOTAL	**2 135 966 695**	**2 255 576 101**	**2 373 222 067**

1. *National share includes conditional allocations to provincial and local spheres, general fuel levy sharing with metropolitan municipalities, debt-service costs, the contingency reserve and provisional allocations*
2. *The direct charges for the provincial equitable share are netted out*

Figure 130: National allocation

Province	Column A	Column B	
	2024/25	Forward Estimates	
		2025/26	2026/27
	R'000	R'000	R'000
Eastern Cape	78 093 492	81 550 032	84 494 979
Free State	33 090 807	34 582 024	36 187 895
Gauteng	127 992 244	133 770 871	139 994 304
KwaZulu-Natal	121 145 053	126 359 814	131 972 012
Limpopo	69 624 859	72 925 123	76 481 608
Mpumalanga	49 499 498	51 738 590	54 149 998
Northern Cape	16 142 917	16 905 233	17 726 629
North West	42 815 602	44 881 770	47 108 870
Western Cape	62 071 168	64 728 396	67 587 920
TOTAL	**600 475 640**	**627 441 853**	**655 704 215**

Figure 131: Provincial allocation

Determination of Each Municipality's Equitable Share of the Local Government Sphere's Share of Revenue Raised Nationally

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Number		Municipality	National Financial Year		
			Column A	Column B	
			2024/25	Forward Estimates	
				2025/26	2026/27
			R'000	R'000	R'000
GAUTENG					
A	EKU	City of Ekurhuleni	5 534 652	5 971 405	6 449 217
A	JHB	City of Johannesburg	7 571 601	8 169 095	8 822 758
A	TSH	City of Tshwane	4 287 120	4 625 428	4 995 539
B	GT421	Emfuleni	1 142 879	1 225 804	1 314 392
B	GT422	Midvaal	172 049	185 364	199 912
B	GT423	Lesedi	217 143	230 183	243 305
C	DC42	Sedibeng District Municipality	309 742	320 017	330 886
Total: Sedibeng Municipalities			**1 841 813**	**1 961 368**	**2 088 495**
B	GT481	Mogale City	647 792	698 911	754 835
B	GT484	Merafong City	305 514	327 280	350 406
B	GT485	Rand West City	466 457	499 207	533 845
C	DC48	West Rand District Municipality	244 123	250 687	256 817
Total: West Rand Municipalities			**1 663 886**	**1 776 085**	**1 895 903**
Total: Gauteng Municipalities			**20 899 072**	**22 503 381**	**24 251 912**

Figure 132: Local Municipality Allocation for Merafong City

The municipality has also under the correct scenario can be able to safely get funding from all the above allocations. These are ideally available allocations that have already been budgeted in the current financial budget for 2024. It is critical that the municipality complies with the required conditions in order to tap into the funding.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

18. CONDITIONAL GRANTS

Merafong City can also tap into the following grants allocation from the presented budget for the 2024/2025 financial year together with the projections for the Medium-Term Expenditure Framework(MTEF).

Table 37: Potential Grants for Infrastructure projects

			Column A	Column B	
				Forward Estimates	
Vote	Name of allocation	Purpose	2024/25	2025/26	2026/27
Transport (Vote 40)	(a) Public Transport Network Grant	To provide funding for accelerated construction and improvement of public and non-motorised transport infrastructure that forms part of a municipal integrated public transport network; to support the planning, regulation, control, management and operations of fiscally and financially sustainable municipal public transport network services.	R7 473 434,00	R8 084 074,00	R7 619 281,00
	(b) Rural Roads Asset Management Systems Grant	To assist district municipalities to set up rural roads asset management systems, and collect road, bridges and traffic data on municipal road networks in line with the Road Infrastructure Strategic Framework for South Africa.	R120 646,00	R126 051,00	R131 826,00
Water and Sanitation (Vote 41)	(a) Regional Bulk Infrastructure Grant	To develop new, refurbish, upgrade and replace ageing bulk water and sanitation infrastructure of regional significance that connects water resources to infrastructure serving extensive areas across municipal boundaries or large regional bulk infrastructure serving numerous communities over a large area within a municipality; to implement bulk infrastructure with a potential of addressing water conservation and water demand management projects or facilitate and contribute to the implementation of local water conservation and water demand management projects that will directly impact on bulk infrastructure requirements.	R3 852 383,00	R3 756 930,00	R3 005 325,00
	(b) Water Services Infrastructure Grant	Facilitate the planning and implementation of various water and sanitation projects to accelerate backlog reduction and enhance the sustainability of services especially in rural municipalities; provide basic and intermittent water and sanitation supply that ensures provision of services to identified and prioritised communities, including spring protection and groundwater development; support municipalities in implementing water conservation and water demand management projects; support the close-out of the existing Bucket Eradication Programme intervention in formal residential areas; support drought relief projects in affected municipalities.	R4 037 673,00	R4 218 561,00	R4 411 831,00
Cooperative Governance (Vote 3)	(a) Integrated Urban Development Grant	To provide funding for public investment in infrastructure for the poor and to promote increased access to municipal own sources of capital finance in order to increase funding for public investment in economic infrastructure; to ensure that public investments are spatially aligned and to promote the sound management of the assets delivered.	R1 145 564,00	R1 202 173,00	R1 303 844,00
	(b) Municipal Disaster Recovery Grant	To rehabilitate and reconstruct municipal infrastructure damaged by a disaster.	R741 003,00	R708 974,00	
	(c) Municipal Infrastructure Grant	To provide specific capital finance for eradicating basic municipal infrastructure backlogs for poor households, microenterprises and social institutions servicing poor communities; to provide specific funding for the development of asset management plans for infrastructure servicing the poor.	R17 054 355,00	R17 927 319,00	R19 443 504,00
	Municipal Disaster Response Grant	To provide for the immediate release of funds for disaster response if an occurrence cannot be adequately addressed in line with section 2(1)(b) of the Disaster Management Act.	R378 342,00	R395 054,00	R413 153,00
	(b) Municipal Systems Improvement Grant	To assist municipalities to perform their functions and stabilise institutional and governance systems as required in the Municipal Systems Act and related local government legislation.	R144 596,00	R151 055,00	R158 183,00
Mineral Resources and Energy (Vote 34)	(a) Energy Efficiency and Demand-Side Management Grant	To provide subsidies to municipalities to implement energy efficiency and demand-side management initiatives within municipal infrastructure in order to reduce electricity consumption and improve energy efficiency.	R235 700,00	R246 260,00	R257 542,00
	(b) Integrated National Electrification Programme (Municipal) Grant	To implement the Integrated National Electrification Programme by providing capital subsidies to municipalities to increase access to electricity, existing and planned residential dwellings (including informal settlements, farm dwellers, new and existing dwellings) and the installation of relevant bulk infrastructure.	R1 746 436,00	R1 697 076,00	R1 654 605,00
Public Works and Infrastructure (Vote 13)	Expanded Public Works Programme Integrated Grant for Municipalities	To incentivise municipalities to expand work creation efforts through the use of labour-intensive delivery methods in the following identified focus areas, in compliance with the Expanded Public Works Programme guidelines: road maintenance including but not limited to block paving and pothole patching; low traffic volume roads and rural roads; basic services infrastructure, including water and sanitation reticulation (excluding bulk infrastructure); other economic and social infrastructure tourism and cultural industries; waste management and cleaning services; parks and beautification; sustainable land-based livelihoods; social services programmes; social services programmes and energy including but not limited to retro-fitting, solar.	R560 103,00	R567 281,00	R593 271,00
		TOTAL	**R37 490 235,00**	**R39 080 808,00**	**R38 992 365,00**

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

19. CURRENT INFRASTRUCTURE PMU CAPITAL PROJECT

The following Capital projects have already been identified by the Municipality and most of them have under implementation at various stages. The projects are funded as indicated.

Table 38: Current Capital Projects

Project No.	Project Description	Expenditure 2023/2024	MID -Year Budget 2023/2024	Balance of Budget 2023/2024
MIG PROJECTS				
P620	P M U Operational Expenses	R3 035 566,66	R3 954 700,00	R919 133,34
P753	Khutsong Roads and Stormwater (Phase 6)	R2 084 986,75	R2 084 987,00	R0,25
P756/ Ph7	Khutsong Roads and Stormwater (Phase 7)	R5 643 895,67	R8 764 895,00	R3 120 999,33
P769/ Ph8	Khutsong Roads and Stormwater (Phase 8)	R817 354,90	R817 355,00	R0,10
P770/ Ph8	Kokosi Roads and Stormwater (Phase 4)	R31 523,24	R1 200 000,00	R1 168 476,76
P723(4)	Kokosi Roads and Stormwater (Phase 4)	R0,00	R0,00	R0,00
P723(5)	Kokosi Roads and Stormwater (Phase 5)	R1 453 619,98	R1 453 620,00	R0,02
P754	Kokosi Roads and Stormwater (Phase 6)	R10 241 205,82	R10 241 206,00	R0,18
P757/ Ph7	Kokosi Roads and Stormwater (Phase 7)	R19 276 032,98	R19 500 000,00	R223 967,02
P771 Ph8	Kokosi Roads and Stormwater (Phase 8)	R2 485 789,42	R2 500 000,00	R14 210,58
P755/Ph6	Wedela Ext 3 Roads and Stormwater (Ph 6)	R757 164,47	R757 165,00	R0,53
P758/ Ph7	Wedela Ext 3 Roads and Stormwater (Ph 7)	R0,00	R1 500 000,00	R1 500 000,00
P772/ Ph8	Wedela Roads and Stormwater (Phase 8)	R798 166,78	R800 000,00	R1 833,22
P759 STAGE 3	Khutsong North Water & Sewer Reticulation Stage 3	R2 815 110,03	R3 500 000,00	R684 889,97
P773 STAGE 4	Khutsong North Water & Sewer Reticulation Stage 4	R969 609,54	R1 200 000,00	R230 390,46
P752	Development of New Kokosi Cemetery	R9 165 301,85	R11 064 460,00	R1 899 158,15
P761	Upgrading & Rehabilitation of Wedela Sports Stadium	R0,00	R0,00	R0,00
P774	Merafong Solar Highmast Lights & Solar Streetlights	R381 842,50	R2 736 457,00	R2 354 614,50
P775	Upgrading of Wedela Recreation Club	R8 500,27	R1 020 155,00	R1 011 654,73
P776	Refurbishing of Kokosi Stadium	R169 105,49	R700 000,00	R530 894,51
INTEGRATED NATIONAL ELECTRIFICATION PROGRAM (INEP) GRANT				
P762	(60MVA 132/6kva) Fochville Bulk Electrical Supply (Phase5)	R0,00	R0,00	R0,00
P765	2x20 MVA Frikkie Substation 44/11 (Change control to Plover)	R10 000 000,00	R25 000 000,00	R15 000 000,00
WATER SERVICES INFRASTRUCTURE GRANT				

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

P763	Upgrading & Rehabilitation of Wedela WWTW (Phase 2)	R0,00	R10 000 000,00	R10 000 000,00
P764	Structure Rehabilitation of 007 Reservoir	R2 972 569,40	R10 000 000,00	R7 027 430,60
PNEW	Replacement of Manhole Covers	R2 784 922,80	R6 000 000,00	R3 215 077,20
P777	Foundation Stabilisation of Addata Reservoir	R70 412,00	R14 806 000,00	R14 735 588,00
HUMAN SETTLEMENTS DEVELOPMENT GRANT (MINING TOWNS ALLOCATIONS				
P747	Khutsong South Ext. 5 Outfall Sewer	R0,00	R2 000 000,00	R2 000 000,00
P749	Khutsong South Installation of Alternative Bulk water Supply	R4 157 225,97	R5 307 658,95	R1 150 432,98
P748	Khutsong South Ext 5 & 6 Internal Roads & Stormwater	R7 103 891,30	R20 426 946,21	R13 323 054,91
P751	Kokosi Ext 6/7 Completion of Sewer Network & installation of water meters (Continue within see P768)	R0,00	R0,00	R0,00
P746	Kokosi Ext 7 East Outfall Sewer & WWTW	R5 049 310,89	R4 812 874,99	-R236 435,90
P766	Khutsong Electricity	R2 528 655,64	R20 000 000,00	R17 471 344,36
P778	Khutsong Rehabilitation of Sinkholes	R1 256 714,26	R12 000 000,00	R10 743 285,74
P767	Fochville Outfall Sewer	R798 439,26	R10 000 000,00	R9 201 560,74
P768	Kokosi Ext 6 Sewer & Water Meters	R939 871,77	R8 000 000,00	R7 060 128,23
Totals		**R97 796 789,64**	**R222 148 480,15**	**R124 351 690,51**

The expenditure for the current financial year upto April 2024 was at the value of **R97 796 789,64** which is approximately **44%** of the total allocation. This is an under expenditure looking at the financial year which is closing at the end of the month of June.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

20. MUNICIPAL EXPENDITURE CHALLENGES

This Master Plan has also gone into details to analyse the spending for MCLM on infrastructure project. The Municipality was allocated a budget for the last financial year ending 30 June 2024. A number of projects are under implementation at different stages. Table 32 shows the projects that have been funded.

There is however a notable slacking in terms of spending on allocated budget. This failure to spend has consequences because if a province or municipality is not spending its allocated funds or does not comply with grant conditions, then further transfers can be withheld or reallocated to another recipient. This will disadvantage the local residence who have a right to adequate service delivery.

Reasons for underspending by the municipality

- The municipality is under-capacitated in terms of technical personnel. There are a lot of projects both planned and in progress which require the municipality to have enough experienced and qualified technical personnel.
- MCLM requires additional capacity within their various end-user departments as well as the PMU. Project-related issues such as extension of time claims, sewer spillages, scope changes, etc. are not addressed timeously and cause avoidable delays.
- Delays in the approval of project milestones and contractor appointments.
- Maintenance issues affect project progress, e.g. sewer spillages, leading to additional costs due to extension of time and professional fees
- Lack of capacity within MCLM for monitoring health and safety/environmental compliance on construction projects.
- The appointed consultants are failing to efficiently monitor the contractors as

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

required leading to the extended period on projects. Projects are taking long to complete and there is no due diligence of the supervision of the projects

- Some projects are being implemented under Turnkey condition which leads to bias on contractor supervision by the consultant as the contractor is the consultant's own choice.

20.1. Section 139 of the Constitution

There are consequences for failure to administer the affairs of the municipality accordingly releases the Section 139 of the Constitution into effect.

Section 139 of the Constitution authorises the provincial executive to intervene in a municipality when it does not fulfil its executive obligation in terms of legislation.

Section 139 (1), (4) and (5): Empowers the provincial executive to intervene in a municipality if:

- A municipality cannot or does not fulfil an obligation in terms of the Constitution or legislation to approve a budget or any revenue-raising measures necessary to give effect to the budget.

- A municipality, because of a crisis in its financial affairs, is in serious or persistent material breach of its obligations to provide basic services or to meet its financial commitments or admits that it is unable to meet its obligations or financial commitments.

When municipalities fail to administer their affairs the provincial executive intervenes by placing the municipality under administration. Currently Merafong City is one of the three municipalities in Gauteng that have been placed under Administration as shown below since 2022.

Gauteng: 3	Emfuleni LM	S139(5) of the Constitution	June 2018	Ongoing
	WestRand DM	S139(5) of the Constitution	February 2019	Ongoing
	Merafong LM	S139(5) of the Constitution	September 2022	Ongoing

Figure 133 : Gauteng Municipalities under administration

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

21. COST ESTIMATE

The following cost estimate have been compiled for the purpose of ensuring that MCLM go ahead and tries to source funds for the various infrastructures in the different towns according to the priorities. The full Bills of Estimates are attached in **Annexure A**.

21.1. Summary of Total Maintenance Cost for Existing Municipal Roads

SRSQS001-MCLM/Estimate Rev04 — 11 July 2024

SCHEDULE "B"

COST ESTIMATE

EXECUTIVE SUMMARY MUNICIPAL TOWNS

SITE WORKS (ROADS AND STORMWATER):

Fochville	Item	R	839 475 701	
Greenspark	Item	R	207 483 740	
Kokosi	Item	R	787 769 886	
Wedela	Item	R	353 253 680	
Khutsong	Item	R	1 939 844 533	
Blybank	Item	R	657 961 677	
Welverdiend	Item	R	488 641 724	
Obelhozer	Item	R	891 399 167	
Carletonville	Item	R	1 474 784 960	
Other	Item	R	0	
SUBTOTAL (1)				**R 7 640 615 068**
PRELIMINARIES:				
Principal Contractor's Preliminaries	15,0% of R 7 640 615 068		cost included	0
Preliminiaries cost included in above costs for each site				
SUBTOTAL (2)				**R 7 640 615 068**
ESCALATIONS:				
N/A				0
SUBTOTAL (2)				**R 7 640 615 068**
PROFESSIONAL FEES AND DISBURSEMENTS:				
N/A				
Brought forward				**R 7 640 615 068**
CONTINGENCY ALLOWANCE:				
Contingency Allowance	10% of R 7 640 615 068			0
Contingency cost included in above costs for each site				
TOTAL ESTIMATED COSTS (EXCL. VALUE ADDED TAX)				**R 7 640 615 068**
VALUE ADDED TAX:				
Provision for Value Added Tax			15%	1 146 092 300
TOTAL ESTIMATED COST (INCL. VALUE ADDED TAX)				**R 8 786 707 368**

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

21.2. Summary of Total Maintenance Cost for Existing Mining Town Roads

T able 39: Cost Summary for all sites

SRSQS001-MCLM/Estimate Rev04						11 July 2024
SCHEDULE "B"						
COST ESTIMATE						
EXECUTIVE SUMMARY MINING TOWNS						
SITE WORKS (ROADS AND STORMWATER):						
Elansrand			Item	R	142 829 963	
Elandsridge			Item	R	149 985 003	
Letsatsing			Item	R	199 677 102	
Phomolong			Item	R	583 580 584	
Doornfontein			Item	R	357 588 753	
Deelkraal			Item	R	288 096 755	
Blyvooruitzicht			Item	R	915 646 527	
Westerndeeplevels			Item	R	437 986 907	
Other			Item	R	0	
SUBTOTAL (1)					R	3 075 391 595
PRELIMINARIES:						
Principal Contractor's Preliminaries	15,0%	of R	3 075 391 595	Preliminiaries cost included		0
Preliminiaries cost included in above costs for each site						
SUBTOTAL (2)					R	3 075 391 595
ESCALATIONS: N/A						0
SUBTOTAL (2)					R	3 075 391 595
PROFESSIONAL FEES AND DISBURSEMENTS: N/A						
Brought forward					R	3 075 391 595
CONTINGENCY ALLOWANCE:						
Contingency Allowance	10%	of R	3 075 391 595			0
Contingency cost included in above costs for each site						
TOTAL ESTIMATED COSTS (EXCL. VALUE ADDED TAX)					R	3 075 391 595
VALUE ADDED TAX:						
Provision for Value Added Tax				15%		461 308 700
TOTAL ESTIMATED COST (INCL. VALUE ADDED TAX)					R	3 536 700 295

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

21.3. MAINTENANCE OF MUNICIPAL ROADS SUMMARIES-ANNEXURE A

1. Khutsong

Table 40: Khutsong cost summary

Item	Description	Total Cost (R)	% of Total Construction Cost (%)
A	Preliminaries -Included in - See schedule "B" (executive summary)	60 310 533,49	3,11%
B	Roads and Paving	1 441 889 668,41	74,33%
C	Stormwater and Drainage	201 514 405,76	10,39%
D	Sinkholes	65 758 464,64	3,39%
E	Contingency - add 10%	170 371 460,77	8,78%
	Total Construction Cost (excluding VAT)	**1 939 844 533,06**	**100,00%**
	Total Construction Cost (including VAT)	**2 230 821 213,02**	**100,00%**

2. Wedela

Table 41: Wedela cost summary

Item	Description	Total Cost (R)	% of Total Construction Cost (%)
A	Preliminaries -Included in - See schedule "B" (executive summary)	13 676 690,98	3,87%
B	Roads and Paving	273 869 850,42	77,53%
C	Stormwater and Drainage	33 593 167,58	9,51%
D	Contingency - add 10%	32 113 970,90	9,09%
	Total Construction Cost (excluding VAT)	**353 253 679,88**	**100,00%**
	Total Construction Cost (including VAT)	**406 241 731,86**	**100,00%**

3. Kokosi

Table 42: Kokosi cost summary

Item	Description	Total Cost (R)	% of Total Construction Cost (%)
A	Preliminaries -Included in - See schedule "B" (executive summary)	21 925 596,46	2,78%
B	Roads and Paving	633 547 834,56	80,42%
C	Stormwater and Drainage	60 681 011,08	7,70%
D	Contingency - add 10%	71 615 444,21	9,09%
	Total Construction Cost (excluding VAT)	**787 769 886,30**	**100,00%**
	Total Construction Cost (including VAT)	**905 935 369,24**	**100,00%**

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

4. Fochville

Table 43: Fochville cost summary

Item	Description	Total Cost (R)	% of Total Construction Cost (%)
A	Preliminaries -Included in - See schedule "B" (executive summary)	46 590 272,82	5,55%
B	Roads and Paving	633 309 011,86	75,44%
C	Stormwater and Drainage	83 260 443,10	9,92%
D	Contingency - add 10%	76 315 972,78	9,09%
	Total Construction Cost (excluding VAT)	**839 475 700,55**	**100,00%**
	Total Construction Cost (including VAT)	**965 397 055,63**	**100,00%**

5. Greenspark

Table 44: Greenspark Cost Summary

Item	Description	Total Cost (R)	% of Total Construction Cost (%)
A	Preliminaries -Included in - See schedule "B" (executive summary)	13 529 669,32	6,52%
B	Roads and Paving	114 410 901,36	55,14%
C	Stormwater and Drainage	60 681 011,08	29,25%
D	Contingency - add 10%	18 862 158,18	9,09%
	Total Construction Cost (excluding VAT)	**207 483 739,93**	**100,00%**
	Total Construction Cost (including VAT)	**238 606 300,92**	**100,00%**

6. Blybank

Table 45: Blybank cost summary

Item	Description	Total Cost (R)	% of Total Construction Cost (%)
A	Preliminaries -Included in - See schedule "B" (executive summary)	19 362 985,53	2,94%
B	Roads and Paving	508 869 074,41	77,34%
C	Stormwater and Drainage	57 958 835,51	8,81%
D	Sinkholes	13 151 692,23	2,00%
E	Contingency - add 10%	58 619 089,55	8,91%
	Total Construction Cost (excluding VAT)	**657 961 677,23**	**100,00%**
	Total Construction Cost (including VAT)	**756 655 928,81**	**100,00%**

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

7. Oberholzer

Table 46: Oberholzer Cost Summary

Item	Description	Total Cost (R)	% of Total Construction Cost (%)
A	Preliminaries -Included in - See schedule "B" (executive summary)	39 759 511,00	4,46%
B	Roads and Paving	684 125 129,84	76,75%
C	Stormwater and Drainage	86 478 238,00	9,70%
D	Contingency - add 10%	81 036 287,88	9,09%
	Total Construction Cost (excluding VAT)	**891 399 166,71**	**100,00%**
	Total Construction Cost (Including VAT)	**1 025 109 041,72**	**100,00%**

8. Carletonville

Table 47: Carletonville Cost Summary

Item	Description	Total Cost (R)	% of Total Construction Cost (%)
A	Preliminaries -Included in - See schedule "B" (executive summary)	68 027 823,07	4,61%
B	Roads and Paving	1 109 040 795,14	75,20%
C	Stormwater and Drainage	163 644 982,00	11,10%
D	Contingency - add 10%	134 071 360,02	9,09%
	Total Construction Cost (excluding VAT)	**1 474 784 960,23**	**100,00%**
	Total Construction Cost (Including VAT)	**1 696 002 704,26**	**100,00%**

9. Welverdiend

Table 48: Welverdiend Cost Summary

Item	Description	Total Cost (R)	% of Total Construction Cost (%)
A	Preliminaries -Included in - See schedule "B" (executive summary)	19 009 525,76	3,89%
B	Roads and Paving	392 046 824,68	80,23%
C	Stormwater and Drainage	33 163 398,71	6,79%
D	Contingency - add 10%	44 421 974,92	9,09%
	Total Construction Cost (excluding VAT)	**488 641 724,07**	**100,00%**
	Total Construction Cost (including VAT)	**561 937 982,68**	**100,00%**

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

21.4. MINING TOWNS ESTIMATE-SEE ANNEXURE B

21.5. SINKHOLE REHABILITATION-SEE ANNEXURE C

21.6. Summary of Construction Cost for Roads in Line With Town Expansions and Economic Development- See Annexure D

Table 49: Summaries for Town Extensions

Town	Extension	km	Cost Estimate
Carletonville	Central	9,0	R58 490 300,00
Elijah Barayi		21,3	R138 325 800,00
Western Deep Levels	WEST WITS VILLAGE EXTENSION	8,0	R52 005 300,00
	Extension 7	10,3	R66 990 800,00
	Portion 123 Wonderfontein	6,1	R39 753 800,00
	Re/Portion 43 of Welverdiend 97 IQ	1,5	R9 922 800,00
	Extension 5	24,0	R155 875 300,00
Khutsong South	Extension 8	21,7	R140 959 800,00
	EXT 7	5,6	R36 511 300,00
	BLOUBOS	7,5	R48 832 800,00
	SEZ	35,0	R22 731 030,00
Carletonville	HERITAGE PRECINCT	0,2	R1 567 300,00
	SWIMMING POOL	0,4	R2 674 300,00
	Extension 7	14,5	R94 202 800,00
	Central	11,0	R71 554 800,00
FOCHVILLE	PUBLIC WORKS	0,9	R5 916 800,00
	Hub	1,6	R10 456 300,00
	EXTENSION 6	3,0	R19 535 300,00
KOKOSI	EXTENSION 7	26,3	R170 890 800,00
Wedela	EXTENSION 4	3,8	R24 748 300,00
Blybank	Extension	32,0	R207 855 300,00
SUBTOTAL (1)			**R1 379 801 030,00**
PRELIMINARIES:			
Principal Contractor's Preliminaries (15%)			R206 970 154,50
SUBTOTAL (2)			**R1 586 771 184,50**
ESCALATIONS:			R0,00
N/A			
SUBTOTAL (3)			**R1 586 771 184,50**
PROFESSIONAL FEES AND DISBURSEMENTS:			
N/A			
Professional Fees and Disbursements			R0,00
CONTINGENCY ALLOWANCE:			
Contingency Allowance (10%)			R158 677 118,45
TOTAL ESTIMATED COSTS (EXCL. VALUE ADDED TAX)			**R1 745 448 302,95**
VALUE ADDED TAX:			
Provision for Value Added Tax			**R261 817 245,44**
TOTAL ESTIMATED COST (INCL. VALUE ADDED TAX)			**R2 007 265 548,39**

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

1. Western Deep Levels Village Ext

Item	Description	Total Cost (R)
1	Preliminaries	5 200 530,00
2	Accommodation of Traffic	95 300,00
3	Clearing and Grubbing	1 920 000,00
4	Loading and Hauling	1 320 000,00
5	Commercial Materials	19 080 000,00
6	Roadbed	8 800 000,00
7	Pavement and Walkways	5 024 000,00
8	Asphalt Layers	12 856 000,00
9	Stormwater Management	2 800 000,00
10	Road Marking	110 000,00
11	Contingency - add 10%	5 720 583,00
	Total Construction Cost (excluding VAT)	**62 926 413,00**
	Total Construction Cost (including VAT)	**72 365 374,95**

2. Carletonville Heritage Precinct

Item	Description	Total Cost (R)
1	Preliminaries	156 730,00
2	Accommodation of Traffic	70 300,00
3	Clearing and Grubbing	48 000,00
4	Loading and Hauling	33 000,00
5	Commercial Materials	477 000,00
6	Roadbed	220 000,00
7	Pavement and Walkways	125 600,00
8	Asphalt Layers	321 400,00
9	Stormwater Management	70 000,00
10	Road Marking	202 000,00
11	Contingency - add 10%	172 403,00
	Total Construction Cost (excluding VAT)	**1 896 433,00**
	Total Construction Cost (including VAT)	**2 180 897,95**

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

3. Blybank Extension

Item	Description	Total Cost (R)
1	Preliminaries	20 785 530,00
2	Accommodation of Traffic	135 300,00
3	Clearing and Grubbing	7 680 000,00
4	Loading and Hauling	5 280 000,00
5	Commercial Materials	76 320 000,00
6	Roadbed	35 200 000,00
7	Pavement and Walkways	20 096 000,00
8	Asphalt Layers	51 424 000,00
9	Stormwater Management	11 200 000,00
10	Road Marking	520 000,00
11	Contingency - add 10%	22 864 083,00
	Total Construction Cost (excluding VAT)	**251 504 913,00**
	Total Construction Cost (including VAT)	**289 230 649,95**

4. Wedela Extension 4

Item	Description	Total Cost (R)
1	Preliminaries	2 474 830,00
2	Accommodation of Traffic	95 300,00
3	Clearing and Grubbing	912 000,00
4	Loading and Hauling	627 000,00
5	Commercial Materials	9 063 000,00
6	Roadbed	4 180 000,00
7	Pavement and Walkways	2 386 400,00
8	Asphalt Layers	6 106 600,00
9	Stormwater Management	1 330 000,00
10	Road Marking	48 000,00
11	Contingency - add 10%	2 722 313,00
	Total Construction Cost (excluding VAT)	**29 945 443,00**
	Total Construction Cost (including VAT)	**34 437 259,45**

5. Kokosi Extension 7

Item	Description	Total Cost (R)
1	Preliminaries	17 089 080,00
2	Accommodation of Traffic	135 300,00
3	Clearing and Grubbing	6 312 000,00
4	Loading and Hauling	4 339 500,00
5	Commercial Materials	62 725 500,00
6	Roadbed	28 930 000,00
7	Pavement and Walkways	16 516 400,00
8	Asphalt Layers	42 264 100,00
9	Stormwater Management	9 205 000,00
10	Road Marking	463 000,00
11	Contingency - add 10%	18 797 988,00
	Total Construction Cost (excluding VAT)	**206 777 868,00**
	Total Construction Cost (including VAT)	**237 794 548,20**

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

6. Kokosi Extension 6

Item	Description	Total Cost (R)
1	Preliminaries	1 953 530,00
2	Accommodation of Traffic	70 300,00
3	Clearing and Grubbing	720 000,00
4	Loading and Hauling	495 000,00
5	Commercial Materials	7 155 000,00
6	Roadbed	3 300 000,00
7	Pavement and Walkways	1 884 000,00
8	Asphalt Layers	4 821 000,00
9	Stormwater Management	1 050 000,00
10	Road Marking	40 000,00
11	Contingency - add 10%	2 148 883,00
	Total Construction Cost (excluding VAT)	**23 637 713,00**
	Total Construction Cost (including VAT)	**27 183 369,95**

7. Kokosi Hub

Item	Description	Total Cost (R)
1	Preliminaries	1 045 630,00
2	Accommodation of Traffic	70 300,00
3	Clearing and Grubbing	384 000,00
4	Loading and Hauling	264 000,00
5	Commercial Materials	3 816 000,00
6	Roadbed	1 760 000,00
7	Pavement and Walkways	1 004 800,00
8	Asphalt Layers	2 571 200,00
9	Stormwater Management	560 000,00
10	Road Marking	26 000,00
11	Contingency - add 10%	1 150 193,00
	Total Construction Cost (excluding VAT)	**12 652 123,00**
	Total Construction Cost (including VAT)	**14 549 941,45**

8. Fochville Public Works

Item	Description	Total Cost (R)
1	Preliminaries	591 680,00
2	Accommodation of Traffic	70 300,00
3	Clearing and Grubbing	216 000,00
4	Loading and Hauling	148 500,00
5	Commercial Materials	2 146 500,00
6	Roadbed	990 000,00
7	Pavement and Walkways	565 200,00
8	Asphalt Layers	1 446 300,00
9	Stormwater Management	315 000,00
10	Road Marking	19 000,00
11	Contingency - add 10%	650 848,00
	Total Construction Cost (excluding VAT)	**7 159 328,00**
	Total Construction Cost (including VAT)	**8 233 227,20**

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

9. Fochville Central

Item	Description	Total Cost (R)
1	Preliminaries	7 155 480,00
2	Accommodation of Traffic	95 300,00
3	Clearing and Grubbing	2 640 000,00
4	Loading and Hauling	1 815 000,00
5	Commercial Materials	26 235 000,00
6	Roadbed	12 100 000,00
7	Pavement and Walkways	6 908 000,00
8	Asphalt Layers	17 701 500,00
9	Stormwater Management	3 850 000,00
10	Road Marking	210 000,00
11	Contingency - add 10%	7 871 028,00
	Total Construction Cost (excluding VAT)	**86 581 308,00**
	Total Construction Cost (including VAT)	**99 568 504,20**

10. Fochville Extension 7

Item	Description	Total Cost (R)
1	Preliminaries	9 420 280,00
2	Accommodation of Traffic	70 300,00
3	Clearing and Grubbing	3 480 000,00
4	Loading and Hauling	2 392 500,00
5	Commercial Materials	34 582 500,00
6	Roadbed	15 950 000,00
7	Pavement and Walkways	9 106 000,00
8	Asphalt Layers	23 301 500,00
9	Stormwater Management	5 075 000,00
10	Road Marking	245 000,00
11	Contingency - add 10%	10 362 308,00
	Total Construction Cost (excluding VAT)	**113 985 388,00**
	Total Construction Cost (including VAT)	**131 083 196,20**

11. Fochville Swimming Pool

Item	Description	Total Cost (R)
1	Preliminaries	267 430,00
2	Accommodation of Traffic	70 300,00
3	Clearing and Grubbing	96 000,00
4	Loading and Hauling	66 000,00
5	Commercial Materials	954 000,00
6	Roadbed	440 000,00
7	Pavement and Walkways	251 200,00
8	Asphalt Layers	642 800,00
9	Stormwater Management	140 000,00
10	Road Marking	14 000,00
11	Contingency - add 10%	294 173,00
	Total Construction Cost (excluding VAT)	**3 235 903,00**
	Total Construction Cost (including VAT)	**3 721 288,45**

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

12. Carletonville Special Economic Zone (SEZ)

Item	Description	Total Cost (R)
1	Preliminaries	22 731 030,00
2	Accommodation of Traffic	135 300,00
3	Clearing and Grubbing	8 400 000,00
4	Loading and Hauling	5 775 000,00
5	Commercial Materials	83 475 000,00
6	Roadbed	38 500 000,00
7	Pavement and Walkways	21 980 000,00
8	Asphalt Layers	56 245 000,00
9	Stormwater Management	12 250 000,00
10	Road Marking	550 000,00
11	Contingency - add 10%	25 004 133,00
	Total Construction Cost (excluding VAT)	**275 045 463,00**
	Total Construction Cost (including VAT)	**316 302 282,45**

13. Carletonville Central

Item	Description	Total Cost (R)
1	Preliminaries	5 850 030,00
2	Accommodation of Traffic	95 300,00
3	Clearing and Grubbing	2 160 000,00
4	Loading and Hauling	1 485 000,00
5	Commercial Materials	21 465 000,00
6	Roadbed	9 900 000,00
7	Pavement and Walkways	5 652 000,00
8	Asphalt Layers	14 463 000,00
9	Stormwater Management	3 150 000,00
10	Road Marking	120 000,00
11	Contingency - add 10%	6 434 033,00
	Total Construction Cost (excluding VAT)	**70 774 363,00**
	Total Construction Cost (including VAT)	**81 390 517,45**

14. Khutsong South Extension 5

Item	Description	Total Cost (R)
1	Preliminaries	15 587 530,00
2	Accommodation of Traffic	95 300,00
3	Clearing and Grubbing	5 760 000,00
4	Loading and Hauling	3 960 000,00
5	Commercial Materials	57 200 000,00
6	Roadbed	26 400 000,00
7	Pavement and Walkways	15 000 000,00
8	Asphalt Layers	38 500 000,00
9	Stormwater Management	8 400 000,00
10	Road Marking	340 000,00
11	Contingency - add 10%	17 124 283,00
	Total Construction Cost (excluding VAT)	**188 367 113,00**
	Total Construction Cost (including VAT)	**216 622 179,95**

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

15. Wonderfontein Portion 123

Item	Description	Total Cost (R)
1	Preliminaries	3 975 380,00
2	Accommodation of Traffic	95 300,00
3	Clearing and Grubbing	1 464 000,00
4	Loading and Hauling	1 006 500,50
5	Commercial Materials	14 548 500,50
6	Roadbed	6 710 000,00
7	Pavement and Walkways	3 830 800,80
8	Asphalt Layers	9 802 700,70
9	Stormwater Management	2 135 000,00
10	Road Marking	161 000,00
11	Contingency - add 10%	4 372 918,25
	Total Construction Cost (excluding VAT)	**48 102 100,75**
	Total Construction Cost (including VAT)	**55 317 415,86**

16. Carletonville Extension 7

Item	Description	Total Cost (R)
1	Preliminaries	3 651 130,00
2	Accommodation of Traffic	95 300,00
3	Clearing and Grubbing	1 344 000,00
4	Loading and Hauling	924 000,00
5	Commercial Materials	13 356 000,00
6	Roadbed	6 160 000,00
7	Pavement and Walkways	3 516 800,80
8	Asphalt Layers	8 999 200,20
9	Stormwater Management	1 960 000,00
10	Road Marking	156 000,00
11	Contingency - add 10%	4 016 243,10
	Total Construction Cost (excluding VAT)	**44 178 674,10**
	Total Construction Cost (including VAT)	**50 805 475,22**

17. RE/PORTION 43 of Welverdiend 97 IQ

Item	Description	Total Cost (R)
1	Preliminaries	992 280,00
2	Accommodation of Traffic	95 300,00
3	Clearing and Grubbing	360 000,00
4	Loading and Hauling	247 500,00
5	Commercial Materials	3 577 500,00
6	Roadbed	1 650 000,00
7	Pavement and Walkways	942 000,00
8	Asphalt Layers	2 410 500,00
9	Stormwater Management	525 000,00
10	Road Marking	115 000,00
11	Contingency - add 10%	1 091 508,00
	Total Construction Cost (excluding VAT)	**12 006 588,00**
	Total Construction Cost (including VAT)	**13 807 576,20**

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

18. Carletonville Bloubos

Item	Description	Total Cost (R)
1	Preliminaries	4 883 280,00
2	Accommodation of Traffic	95 300,00
3	Clearing and Grubbing	1 800 000,00
4	Loading and Hauling	1 237 500,00
5	Commercial Materials	17 887 500,00
6	Roadbed	8 250 000,00
7	Pavement and Walkways	4 710 000,00
8	Asphalt Layers	12 052 500,00
9	Stormwater Management	2 625 000,00
10	Road Marking	175 000,00
11	Contingency - add 10%	5 371 608,00
	Total Construction Cost (excluding VAT)	**59 087 688,00**
	Total Construction Cost (including VAT)	**67 950 841,20**

19. Khutsong Ext 8

Item	Description	Total Cost (R)
1	Preliminaries	14 095 980,00
2	Accommodation of Traffic	135 300,00
3	Clearing and Grubbing	5 208 000,00
4	Loading and Hauling	3 580 500,00
5	Commercial Materials	51 754 500,00
6	Roadbed	23 870 000,00
7	Pavement and Walkways	13 627 600,00
8	Asphalt Layers	34 871 900,00
9	Stormwater Management	7 595 000,00
10	Road Marking	317 000,00
11	Contingency - add 10%	15 505 578,00
	Total Construction Cost (excluding VAT)	**170 561 358,00**
	Total Construction Cost (including VAT)	**196 145 561,70**

20. Elijah Barayi

Item	Description	Total Cost (R)
1	Preliminaries	13 832 580,00
2	Accommodation of Traffic	95 300,00
3	Clearing and Grubbing	5 112 000,00
4	Loading and Hauling	3 514 500,00
5	Commercial Materials	50 800 500,00
6	Roadbed	23 430 000,00
7	Pavement and Walkways	13 376 400,00
8	Asphalt Layers	34 229 100,00
9	Stormwater Management	7 455 000,00
10	Road Marking	313 000,00
11	Contingency - add 10%	15 215 838,00
	Total Construction Cost (excluding VAT)	**167 374 218,00**
	Total Construction Cost (including VAT)	**192 480 350,70**

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

21. Khutsong South Extension 7

Item	Description	Total Cost (R)
1	Preliminaries	6 699 080,00
2	Accommodation of Traffic	95 300,00
3	Clearing and Grubbing	2 472 000,00
4	Loading and Hauling	1 699 500,00
5	Commercial Materials	24 565 500,00
6	Roadbed	11 330 000,00
7	Pavement and Walkways	6 468 400,00
8	Asphalt Layers	16 552 100,00
9	Stormwater Management	3 605 000,00
10	Road Marking	203 000,00
11	Contingency - add 10%	7 368 988,00
	Total Construction Cost (excluding VAT)	**81 058 868,00**
	Total Construction Cost (including VAT)	**93 217 698,20**

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

21.7. Summary of Rehabilitation Cost for Roads proposed for De-Proclamation- See Annexure E

1. R500 From N12 to Carletonville

Item	Description	Total Cost (R)
1	Preliminaries	18 334 506,00
2	Accommodation of Traffic	125 300,00
3	Clearing and Grubbing	6 487 680,00
4	Loading and Hauling	4 460 280,00
5	Commercial Materials	77 041 200,00
6	Roadbed	29 735 200,00
7	Pavement and Walkways	13 690 400,00
8	Asphalt Layers	43 403 800,00
9	Stormwater Management	7 630 000,00
10	Road Marking	771 200,00
11	Contingency - add 10%	20 167 956,60
	Total Construction Cost (excluding VAT)	**221 847 522,60**
	Total Construction Cost (including VAT)	**255 124 650,99**

2. R500 From R501 to Western Deep Levels

Item	Description	Total Cost (R)
1	Preliminaries	19 847 082,00
2	Accommodation of Traffic	125 300,00
3	Clearing and Grubbing	7 023 360,00
4	Loading and Hauling	4 828 560,00
5	Commercial Materials	83 402 400,00
6	Roadbed	32 190 400,00
7	Pavement and Walkways	14 820 800,00
8	Asphalt Layers	46 987 600,00
9	Stormwater Management	8 260 000,00
10	Road Marking	832 400,00
11	Contingency - add 10%	21 831 790,20
	Total Construction Cost (excluding VAT)	**240 149 692,20**
	Total Construction Cost (including VAT)	**276 172 146,03**

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

3. R501 From N12 to Khutsong

Item	Description	Total Cost (R)
1	Preliminaries -Included in - See schedule "B" (executive summary)	36 996 610,00
2	Accommodation of Traffic	125 300,00
3	Clearing and Grubbing	13 094 400,00
4	Loading and Hauling	9 002 400,00
5	Commercial Materials	155 496 000,00
6	Roadbed	60 016 000,00
7	Pavement and Walkways	27 632 000,00
8	Asphalt Layers	87 604 000,00
9	Stormwater Management	15 400 000,00
10	Road Marking	1 596 000,00
11	Contingency - add 10%	40 696 271,00
	Total Construction Cost (excluding VAT)	**447 658 981,00**
	Total Construction Cost (including VAT)	**514 807 828,15**

4. R500 From N12 To Fochville

Item	Description	Total Cost (R)
1	Preliminaries	12 343 146,00
2	Accommodation of Traffic	125 300,00
3	Clearing and Grubbing	4 404 480,00
4	Loading and Hauling	3 028 080,00
5	Commercial Materials	52 303 200,00
6	Roadbed	19 096 000,00
7	Pavement and Walkways	9 294 400,00
8	Asphalt Layers	29 466 800,00
9	Stormwater Management	5 180 000,00
10	Road Marking	533 200,00
11	Contingency - add 10%	13 577 460,60
	Total Construction Cost (excluding VAT)	**149 352 066,60**
	Total Construction Cost (including VAT)	**171 754 876,59**

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

5. Road D92 between P111 and R501 for 2,3km

ITEM NO	DESCRIPTION		TOTAL COST
1	Preliminaries and Generals	R	1 948 266
2	Accomodation of Traffic	R	125 300
3	Clearing and Grubbing	R	684 480
4	Loading and Hauling	R	470 580
5	Commercial Materials	R	8 128 200
6	Roadbed	R	3 137 200
7	Pavement and Walkways	R	1 444 400
8	Asphalt Layers	R	4 579 300
9	Stormwater Management	R	805 000
10	Road Marking	R	108 200
11	Contingency Add 10%	R	2 143 093
	TOTAL CONSTRUCTION COST (EXCL. OF VAT)	**R**	**23 574 019**
	VAT @ 15 %	**R**	**3 536 103**
	TOTAL CONSTRUCTION COST (INCL. OF VAT)	**R**	**27 110 121**

6. Road D92 between R500 and D331 for 10,4km

ITEM NO	DESCRIPTION		TOTAL COST
1	Preliminaries and Generals	R	8 761 738
2	Accomodation of Traffic	R	194 100
3	Clearing and Grubbing	R	3 095 040
4	Loading and Hauling	R	2 127 840
5	Commercial Materials	R	36 753 600
6	Roadbed	R	14 185 600
7	Pavement and Walkways	R	6 531 200
8	Asphalt Layers	R	20 706 400
9	Stormwater Management	R	3 640 000
10	Road Marking	R	383 600
11	Contingency Add 10%	R	9 637 912
	TOTAL CONSTRUCTION COST (EXCL. OF VAT)	**R**	**106 017 030**
	VAT @ 15 %	**R**	**15 902 554**
	TOTAL CONSTRUCTION COST (INCL. OF VAT)	**R**	**121 919 584**

7. Road D2581 Links Khutsong Town with Carletonville for 2,9km

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

ITEM NO	DESCRIPTION		TOTAL COST
1	Preliminaries and Generals	R	2 452 458
2	Accomodation of Traffic	R	125 300
3	Clearing and Grubbing	R	863 040
4	Loading and Hauling	R	593 340
5	Commercial Materials	R	10 248 600
6	Roadbed	R	3 955 600
7	Pavement and Walkways	R	1 821 200
8	Asphalt Layers	R	5 773 900
9	Stormwater Management	R	1 015 000
10	Road Marking	R	128 600
11	Contingency Add 10%	R	2 697 704
	TOTAL CONSTRUCTION COST (EXCL. OF VAT)	**R**	**29 674 742**
	VAT @ 15 %	**R**	**4 451 211**
	TOTAL CONSTRUCTION COST (INCL. OF VAT)	**R**	**34 125 953**

8. Road P89/1 Link Merafong & Randwest, Mogale, for 2,6km

ITEM NO	DESCRIPTION		TOTAL COST
1	Preliminaries and Generals	R	2 200 362
2	Accomodation of Traffic	R	125 300
3	Clearing and Grubbing	R	773 760
4	Loading and Hauling	R	531 960
5	Commercial Materials	R	9 188 400
6	Roadbed	R	3 546 400
7	Pavement and Walkways	R	1 632 800
8	Asphalt Layers	R	5 176 600
9	Stormwater Management	R	910 000
10	Road Marking	R	118 400
11	Contingency Add 10%	R	2 420 398
	TOTAL CONSTRUCTION COST (EXCL. OF VAT)	**R**	**26 624 380**
	VAT @ 15 %	**R**	**3 993 657**
	TOTAL CONSTRUCTION COST (INCL. OF VAT)	**R**	**30 618 037**

9. Road D331 Link between Gauteng and North West Prov for 1,3km

ITEM NO	DESCRIPTION		TOTAL COST
1	Preliminaries and Generals	R	1 107 946
2	Accomodation of Traffic	R	125 300
3	Clearing and Grubbing	R	386 880
4	Loading and Hauling	R	265 980
5	Commercial Materials	R	4 594 200
6	Roadbed	R	1 773 200
7	Pavement and Walkways	R	816 400
8	Asphalt Layers	R	2 588 300
9	Stormwater Management	R	455 000
10	Road Marking	R	74 200
11	Contingency Add 10%	R	1 218 741
	TOTAL CONSTRUCTION COST (EXCL. OF VAT)	**R**	**13 406 147**
	VAT @ 15 %	**R**	**2 010 922**
	TOTAL CONSTRUCTION COST (INCL. OF VAT)	**R**	**15 417 069**

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

10. Road P149/1 Link of Fochville to N12 for 2,7km

ITEM NO	DESCRIPTION		TOTAL COST
1	Preliminaries and Generals	R	2 284 394
2	Accomodation of Traffic	R	125 300
3	Clearing and Grubbing	R	803 520
4	Loading and Hauling	R	552 420
5	Commercial Materials	R	9 541 800
6	Roadbed	R	3 682 800
7	Pavement and Walkways	R	1 695 600
8	Asphalt Layers	R	5 375 700
9	Stormwater Management	R	945 000
10	Road Marking	R	121 800
11	Contingency Add 10%	R	2 512 833
	TOTAL CONSTRUCTION COST (EXCL. OF VAT)	**R**	**27 641 167**
	VAT @ 15 %	**R**	**4 146 175**
	TOTAL CONSTRUCTION COST (INCL. OF VAT)	**R**	**31 787 343**

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:

Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632

Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

22. RECOMMENDATIONS

The following recommendations have been submitted in line with the Master Plan.

22.1. Establishment of a Road and Stormwater Asset Management System

A Roads Asset Management System (RAMS) is a technical management and geospatial information system that caters for the viewing, reporting and processing of technical data ranging from condition, trafficability, maintenance history through to utilization and optimization of these roads assets. This is a live online system solely owned by the municipality.

Information that can be captured on the system:

- all the road and stormwater networks in the municipality
- When the road or stormwater network was constructed
- Length of the network
- Surface condition (gravel, paving, asphalt)
- conditions at any given time
- maintenance history
- Stormwater pipe sizes
- Positions of kerb inlets and manholes
- Estimate of date for routine maintenance/ rehabilitation or upgrade
- Urgent projects can be indicated

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Ultimately, this technical system is designed to support the storage of asset information and facilitate asset managers to make informed decisions on the lifecycle of the assets. This will allow timeous and accurate resource allocations. However this will require a budget of it's on.

22.2. Transport Study for the Municipality

There is need to do a Traffic Impact Assessment (TIA) for each town in order to design roads that can be fully utilised and that suits the traffic behaviour for the different towns. A TIA is required in order to determine if the current developments as well as future developments have the potential to generate significant additional traffic and whether this will have an impact on the adjacent road network. The TIA would determine whether the development necessitates changes to the existing or planned road infrastructure or public transportation services. This needs to be done before the implemented of the projects for each site.

In summary the TIA will determine the following:

- Intersection upgrades
- Need for widening of lanes
- Future roads planned by Gautrans and SANRAL
- Required traffic aspects for the new roads in line with the economic development plans as well as the town extensions.
- Public transport system inclusion, this might necessitate the provision of bus stops and tax ranks at strategic points
- Nom-motorized Transport (NMT) universal access requirement

22.3. Other specialist studies

This has already been mentioned under Chapter 5. This report should not be mistaken for a detailed design report. A lot of assumptions have been made to determine the designs

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

for the different roads based on experience. Specialists should be appointed during the implementation stage. This will determine accurate designs for each particular road.

22.4. Maintenance Plan

A maintenance plan is key and this should be established.
Many maintenance activities are designed to deter and impede asset deterioration. Therefore, delaying these activities can cause assets to deteriorate more quickly over time. This is the core impact of delayed maintenance, and the main driver of several consequences, including:

- **Increased long term Municipal costs**. Delaying maintenance can require municipalities to perform more extensive and expensive maintenance actions earlier than they otherwise would have. The extensive work can increase an asset's life cycle cost.

- **Increased user costs.** Bridges and roads keep our economy moving by keeping goods and people connected. A poorly maintained system will eventually experience a rapid decline in the level of service it provides. Under normal circumstances, detouring around closed bridges and driving over bridges in poor condition increases the cost of driving through increased wear and tear on vehicles, travel time, and fuel cost. If a section of highway needs major repairs, municipalities close the road, close sidewalks, reduce the total number of lanes, and, at times, impose weight-restrictions, all of which can reduce capacity of the roadway, increases congestion and delay, and make travel less reliable. This slows the delivery of goods, commute times, impacts people visiting family, and visitors visiting special destinations. Impacting connectivity has a negative impact on the economy.

- **Increased risk of failure during catastrophic events.** Infrastructure in disrepair potentially is less structurally sound and could fail more readily when catastrophic events occur. For example, a bridge with a crumbling concrete deck has a worse

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

chance of surviving a significant weather event than a well maintained bridge.

- **Increased risk of failure under normal conditions.** Bridges are more likely to fail under normal conditions when they are not properly maintained. Poorly maintained pavements and bridges increase safety risks for drivers, potentially increasing the economic cost of lost lives.
- **Decreased safety.** Roads and bridges in disrepair can provide a rougher traveling surface, which can increase the chances of a driver losing control of their vehicles and crashing. Rougher roadways can increase vibration exposure to drivers and pose health risks. More deformed roadway edges can cause drivers to lose control.
- **Loss of public support for transportation agencies.** As the level of service declines and user costs increase, users could eventually lose faith in an agency's ability to effectively manage its infrastructure and budget. Arguments to increase revenue might be less likely to succeed if this trust and support fades, which could make it more difficult to capture needed revenue for improved maintenance in the future, and thereby introduce a self-reinforcing feedback loop.

A maintenance budget should be set aside for all scheduled routine maintenance of roads and stormwater infrastructures.

22.5. Paving Blocks as a preferred road surfacing

We recommend the use of paving blocks for the upgrading of all gravel roads in the various towns. The focus should be for all access roads within the towns. Asphalt surfaced roads that require rehabilitation can also adopt the use of paving block.

The cost of interlocking block paving, the skill or workmanship required and time needed to install a block paving road are the main disadvantages of the surfacing method. Once

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

installed, however, a block paving road could last for more than 20 years with low maintenance. This makes it a more cost-effective option in the long run.

Concrete pavers offer distinct advantages such as:

- Labour intensive activity therefore there is significant job creation within the communities. With the growing rate of unemployment this will be a welcome option by any community.
- Highly durable and thus able to withstand extreme traffic and weather.
- Low maintenance and low cost of ownership over the lifespan of the product.
- Superb load-bearing capacity.
- Versatile as many surface designs can be created through the various colours and placement.
- Non-slip surface which makes it perfect for wet weather driving or walking.
- Repairing a damaged paver doesn't involve the removal and replacement of the entire section.
- Installation is relatively quick in comparison with many other types of surfaces.
- Pavers can be easily removed and replaced for utility repairs.
- Pavers can be used in any climate and can be trafficked on immediately upon compaction.
- Cracking, which is common with traditional asphalt and concrete pavements, is not an issue with these interlocking concrete pavers due to the joints between the pavers.

22.6. Economic Development for Improved Infrastructure

It is also highly recommended that the municipality sources funds for proposed economic development projects. There is need for marketing of these projects in order to attract local and regional investors. These projects have a potential to change the economical trajectory of the municipalities as well as the level of services for the local residents.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

22.7. Roads proposed for de-proclamation

There are a few stretch of roads that have been identified and proposed for de-proclamation. This will enhance revenue collection for the municipality. However the cost implications for the frequent rehabilitation to keep it to the required standard should be considered before a decision can be made.

22.8. Recommended Infrastructure Funders

It is also recommended that MCLM approaches other public and private funders for infrastructure development. There are a number of potential funders that have been identified.

Table 50: Potential Funders

Organisation	Brief Description
Development Band of South Africa (DBSA)	Their mandate is to promote economic growth as well as regional integration for sustainable development projects and programmes across the Southern Africa.
Infrastructure South Africa (ISA)	Is a catalyst for closing the infrastructure investment gap and meeting the infrastructure target set out in the National Development Plan and provides best practises in project preparation, leadership on infrastructure planning, technical and financial support for nationally prioritised infrastructure projects and programmes.
African Infrastructure Investments Managers (AIIM)	Develops and manages private equity infrastructure funds designed to invest long-term institutional unlisted equity in African infrastructure projects.
Industrial Development Corporation (IDC)	Provides reliable infrastructure, directly and indirectly, fuels economic growth by reducing production costs and facilitating market access and enabling productive activities (Value chains)

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

Emerging Africa Infrastructure Fund (EAIF)	Provides long-term commercial debt to deliver inclusive and impactful infrastructure projects in Africa
Investec-Energy and infrastructure finance	Provides financing solutions and specialist financial services for private sector, government, and PPP infrastructure projects in Sub-Saharan Africa.
RMB-Infrastructure Sector Solutions	Provides advisory and funding solutions across key sectors, including power and renewables, transport, Information and Communication Technology (ICT), infrastructure projects etc
Africa Infrastructure Fund (AIF)	Creates and enables opportunities through investments in African infrastructure. Its purpose is to support sustainable economic growth and prosperity on the continent and at the same time deliver attractive returns to its investors.
Gap Infrastructure Corporation (GIC)	Infrastructure developer specialising in design, build, and financing (DBF) of infrastructure projects in Africa

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

23. CONCLUSION

The main focus of this Roads and Stormwater Master Plan was to consolidate and coordinate all the planning actions for MCLM. The purpose was to present an acceptable infrastructure development plan for the Municipality in order to assist with the implementation of projects that will ensure the improvement and sustainability of the current and future road and stormwater infrastructure.

The Master Plan should be seen as the first step in a continuous process consisting of:

- Project identification, normally based on a recognised problem or need;
- preliminary design of project solution;
- inclusion of project in database and on maps;
- prioritisation of projects;
- allocation of funding and project execution;
- updating of project status in database and on maps; and
- Development of an asset management programme for all the infrastructure.

In conclusion, this Road and Stormwater Master Plan provides a comprehensive and integrated approach to managing and planning for the transportation infrastructure and stormwater resources. By prioritizing sustainability, resilience, and future plans, we have created a vision for a safer, more efficient, and environmentally conscious transportation system.

This plan will guide the municipality's efforts to:

- ❖ Enhance road safety and accessibility
- ❖ Mitigate flood risks and improve stormwater management
- ❖ Protect and enhance environmental resources
- ❖ Support economic growth and development

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

- Foster a more livable and connected community

This will require committed implementation plan in a phased and flexible manner, incorporating new technologies, innovations, and community feedback along the way. MCLM is capable and can create a brighter future for its communities, where roads and stormwater systems support the well-being of all residents, businesses, and the environment.

It is the now the municipality's duty to source for funding in order to start with the implementations of the projects. It is recommended that MCLM acts swiftly to address the findings as more time will result in more deterioration of the infrastructures and accumulation of a backlog in infrastructure service delivery and unavoidably more cost as well as safety concerns.

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

24. ANNEXURES

ANNEXURE A

MAINTENANCE COST OF MUNICIPAL ROADS SUMMARIES

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

ANNEXURE B

MAINTENANCE COST OF MINING TOWNS SUMMARIES

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

ANNEXURE C

COSTS FOR SINKHOLE REHABILITATION

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mabunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

ANNEXURE D

CONSTRUCTION COST FOR ROADS IN LINE WITH TOWN EXPANSIONS AND ECONOMIC DEVELOPMENT

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005

ANNEXURE E

SUMMARY OF REHABILITATION COST FOR ROADS PROPOSED FOR DE-PROCLAMATION

Chief Executive Officer: Mr Sandro Shikwambana - sandro@srsqs.co.za | **Strategic - Operations - Corporate Decisions Head:** Mr Marito Mbunda - marito@srsqs.co.za **Office Manager - Human Resource and Finance:** Mrs Sthembile Modiba - sthembile@srsqs.co.za/admin@srsqs.co.za

Offices:
Pretoria: 22 Karee Street Irene, Southdowns Office Park, Block D, Suite 12-14. - **Tel:** 012 665 2632
Polokwane 100 Marshall Street, Polokwane Central - **Tel:** 015 291 1005