



**PROPOSED FILLING STATION
ON PORTION 41 OF THE FARM
ROOIDRAAI NO. 34-JT, LYDENBURG,
MPUMALANGA**

SERVICES REPORT

OCTOBER 2020

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SERVICES REPORT: PROPOSED FILLING STATION ON PORTION 41 OF THE FARM ROODRAAI NO. 34-JT, LYDENBURG, MPUMALANGA.

1. INTRODUCTION

1.1. General

Mhiduve (Pty) Ltd has been appointed by Mr. Marais to compile a Services Report for the: **PROPOSED FILLING STATION ON PORTION 41 OF THE FARM ROODRAAI NO. 34-JT, LYDENBURG, MPUMALANGA.**

1.2. Design criteria and specifications

Design criteria and specifications adopted are in accordance with *Guidelines for the Provision of Engineering Services and Amenities in Residential Township Development* and *Guidelines for Human Settlement Planning and Design* (Red Book) as issued by the CSIR. The specifications for use with the projects are SABS 1200 for Civil Engineering Construction.

2. SCOPE OF SERVICES SCHEME REPORT

This report deals with the proposed engineering standards to be used for the design of civil engineering infrastructure for the: **PROPOSED FILLING STATION ON PORTION 41 OF THE FARM ROODRAAI NO. 34-JT, LYDENBURG, MPUMALANGA.**

2.1. Design Standards

The design criteria are based on the planning principles in *Guidelines for the Provision of Engineering Services and Amenities in Residential Township Development* and *Guidelines for Human Settlement Planning and Design* (Red Book).

2.2. Town Planning and Layout

The layout was completed by Welwyn Town Planners. The proposed township is not affected by the 1:100-year floodline.

2.3. Services

2.3.1. Roads

Existing roads

The access to the filling station will be from the R540 located on the east and the R577 located to the south west of the property.

Road design criteria

The preliminary proposed geometric and pavement design norms for the internal roads in the proposed development are given in *Table 1* below:

Road Classification	Surfacing (Base Course)	Base	Sub base	In-Situ
Class 5	Block Paving 80mm	150mm G2 Compacted 102% MOD AASHTO Density)	150mm G5 Compacted (93% MOD AASHTO Density) or 150mm C4 Cemented (95% MOD AASHTO Density)	Scarified and Recompacted 150mm (93% MOD AASHTO density)

Table 1: Proposed pavement design

Road Construction Standards

Roads are to be constructed to standards as specified in SABS 1200. Road materials conforming to the requirements of TRH 14 will be specified. Road building materials in the area still need to be identified. (A Geotechnical Study is currently being undertaken)

Traffic Statement

An inception meeting was conducted with the Mpumalanga Roads Department with regards to the application for approval of the proposed entrances. Approval of Principle for these entrances would be confirmed once the Traffic Impact Study has been completed.

The Traffic Impact Study is in the process of being finalized for submission to all the relevant authorities.

Ownership and Maintenance

After construction of the internal road network system, the owner will take over, operate and maintain these roads.

2.3.2. Storm water

The development is situated on land with a slope of between 1% to 2.5%. These will lead to low flow velocities with very little erosion of the in-situ soils. The drainage system should be designed and constructed to minimize the impact of the development on the stormwater characteristics of the property.

The main function of the roads in a residential area is to carry traffic. They should however also have a stormwater management function. During minor to moderate rainfalls these two should not conflict.

The stormwater management system within the proposed developments will not accommodate runoff from adjacent higher lying areas.

The property is not affected by the 1:100 year floodline.

The design standards proposed are:

- Kerbed, surfaced roads to accommodate 1:20 year return period stormwater runoff.
- Erosion protection and stabilization of erodible areas and associated sedimentation control.

The storm water system design accommodates the surface run-off from all the even into the roads which acts as channels to dispose all storm water to lower laying areas. It is estimated that the amount of storm water run-off from this development does not exceed the maximum run-off that can be accommodated surface wise into the internal road network.

The preliminary storm water design indicates that drainage will be by means of surface runoff in the roads, from where it will then be conveyed until it reaches the nearest water course to the west of the property. The disposal of collected storm water from the roads is designed in such a manner as not to concentrate storm water run-off and to cause the least amount of impact on the existing environment.

2.3.3. Sewerage

General

Internal sewerage disposal the development will be handled by means of an underground uPVC pipe network. Pipe sizes will be as per the hydraulic engineering design with all relevant elements like manholes, erf connections, etc. to the specification of the local authority.

A Puricare Package Plant is proposed for this development. The reticulation system will drain to a conservancy tank that will be constructed on the south-eastern side of the stand. (Effluent from this package plant could be used for irrigation purposes as well as the planned washbay)

The proposed system is supported by **Department of Water Affairs and Forestry, Ministry: Environmental Affairs and Tourism** and by the **Deputy-Minister: Agriculture and Land Affairs**.

Design Criteria

The design criteria for the sewerage systems are as follows:

- Daily flow: 2 700 liters
- Peak factor 2.5
- Minimum grades
110mm dia 1:60
- Min velocity 0.7m/s
- Max manhole spacing 80m
- Infiltration 15%
- Max flow depth 167% of peak
- Main lines min. dia 110mm
- Manning coefficient n=0.012
- Peak flow: 0.078 l/s
- Total flow per day: 2 700 l/day

Materials to be used

The proposed materials to be used for sewerage reticulation are:

- 110mm dia pipes UPVC class 9 solid wall Supradur
- Bedding and backfill SABS 1200
- Minimum pipe size: 110mm dia
- Manholes Precast concrete
- Covers Concrete

Ownership and Maintenance

After construction of the sewerage network system, the owner will take over, operate and maintain these services.

2.3.4 Water Supply and Reticulation

Domestic and fire water supply to the new filling station will be by means of Class 10 HDPE pressure pipes as per the hydraulic engineering design to be completed. The water reticulation will consist of 75mm dia and 50mm dia HDPE pipelines.

Water for this proposed development will be obtained from a new borehole to be drilled. The borehole will be tested to determine if the water is suitable with regards to quality and quantity to be used as potable drinking water for the proposed development. Should the quality not be deemed suitable, a chlorination plant would be added. The water will be pumped from the borehole up to an elevated tank (with a reserve capacity of 2,5 days – 8000 liters), from where it will flow under gravity to the different areas.

Water Demand Criteria

The water demand criteria used for the calculation of pipe sizes are as follows:

- Average daily demand (ADD) - 3 200l/day (800m²@400l/100m²)
- Peak factor - 2.2
- Fire risk - moderate
- Fire flow criteria - 8 l/s @ 0.7 hours
- Hydrant spacing - 240m (max)
- Instantaneous demand - 24m
- Minimum pressure - 20m
- Position - As per design guidelines.
- Pipe material - uPVC class 12/ HDPE class 10
- Pipe size minimum - 50 HDPE
- 75 HPDE
- Peak demand - 0.081 l/s

Water Demand

The water demand for the township has been calculated for three possible scenarios:

- I. Instantaneous demand x Peak factor
- II. Fire demand at various hydrants individually (not simultaneously)
- III. Instantaneous demand x Peak factor + fire demand as above

Ownership and Maintenance

After construction of the water network system, the owner will take over, operate and maintain these services.

2.3.5. Solid waste

All solid waste will be accommodated within a designated refuse area and collected by the owner to be disposed of at the municipal waste disposal site.

2.3.6. Electricity

Refer to electrical report.

We trust you find the above-mentioned in order. Should you require any additional information, please contact the undersigned.

Yours faithfully



D. Slabbert
for **MHIDUVE (Pty) Ltd**