SIYANQOBA TOWNSHIP:
BULK SERVICES REPORT

PROPOSED DEVELOPMENT OF
SIYANQOBA TOWNSHIP:
BULK SERVICES REPORT IN WITBANK

ENGINEERING SERVICES REPORT

Rev. 1

NOVEMBER 2013

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Siyanqoba Township: Bulk Services Report: Engineering Services Report

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1 INTRODUCTION

This report will evaluate the existing engineering services for the proposed Siyanqoba Township Development.

The proposed development is a residential township development which comprises of 8000 residential ervan, 6 educational facilities and a business node.

The site is located in Witbank in the Mpulalanga Province at the following coordinates: 25°48'16.43"S, 29°10'20.88"E. All known existing services will be evaluated to determine the preliminary extent and possible connection opportunities.

2 SITE DESCRIPTION

The proposed development is situated along the R544 North West of the town of Witbank the following coordinates: 25°48'16.43"S, 29°10'20.88"E.

This site is currently undeveloped open fields, please see attached locality plan.

3 GEOTECHNICAL INVESTIGATION

A geotechnical desktop study is currently being undertaken by geotechnical consultants in order to determine the suitability of the site with regards to the geotechnical structure.

4 EXISTING BULK SERVICES

Design of services will be in accordance with the “Guidelines for Human Settlement Planning and Design” (Red books).

Construction will be specified to be in accordance with SANS 1200.

Herewith a description of the existing services mentioned above.

4.1 Sewer

The proposed sewer system in the development is to be a gravity waterborne sewerage network which will service the area. There is currently existing 250mm diameter sewer bulk line which feeds to the sewerage works at Klipspruit.

The sewerage effluent could connect to the existing bulk line which runs across the proposed development.

However Klipspruit Sewerage works is a 10Ml/day plant and is currently operating at 15Ml/day therefore it's operating at over capacity. Therefore currently it may not be feasible to feed into send the effluent from the proposed development to the Klipspruit sewerage works.

As per Human Settlement design standards the ADWF for a low income group development is 500l/day/unit and the Peak factor is 1.15 and therefore the estimated additional flow to the sewerage works is as follows:

ADWF = 4Ml/d (500l/d/unit x 8000 units)

PDWF = 4.6Ml/d (4 000 000 x 1.15)

PWWF = 9.2Ml/d (4 600 000 x 2)

Therefore more capacity is required at the existing sewerage works in order to cater for the proposed additional flow from the Siyanqoba Township.

Conclusion

The internal network will consist of 250mm diameter Class 34 uPVC pipes with 110mm diameter connections to each erf.

There are possible options that could be explored in order to counter the issue of the extensive effluent flow. Which are namely:

- To construct a new onsite sewerage works and dispose of the treated effluent into the 250mm diameter pipe that passes through the site.
- The developer together with the municipality and other developers in the area could look at subsidising in increasing the capacity of the existing Klipspruit Sewerage works in order to cater for future developments in the area.

4.2 Water

The proposed water reticulation has access to an existing 250mm dia. uPVC water pipe which is located 8km from the proposed development just below the Witbank train Station.

The existing water treatment works is a plant which is located at the Doonpoort Dam with a 42Ml Point A command reservoir and several bulk reservoirs feeding from it.

There were no Flow and pressure test were done by the Municipality on 50mm dia water pipe in order to determine the required fire flow rate.

The estimated Annual Average Daily Demand for the developments is as follows:

Description	Area	AADD	Total (l/d)
Single Residential Erven	8000units	500l/c/d	4 000 000l/d
Business Erf	2069 m²	400l/100m²/d	8 276 l/d
Church	1000 m²	2m³/ha/d	200 l/d
Schools	8000 m²	2-15m³/ha/d	1000 l/d
Taxi rank	1000 m²	2m³/ha/d	200 l/d
Public open space	20000 m²	10-15m³/ha/d	20000 l/d
Total			4 031 076l/d

The estimated average annual daily demand (AADD) for water will be 4 031 076l/d or 46.656l/s.

Conclusion

The internal network will consist of 75mm – 160mm diameter uPVC Class 9 pipes with an erf connection to each erf.

It may become necessary to also increase the capacity of the water treatment works in order to cater for the additional 10Ml which exclude emergency water.

There will be connection required from the take off point which is located 8km from the site and a bulk main laid to supply a 10Ml reservoir that could cater for the 48hour storage will be constructed and will serve the area.

4.3 Stormwater

The minor storm (5 year storm) will be conveyed in an underground pipe system with side inlet catch-pits and manholes. The difference between the minor storm and major (50 year storm) will be conveyed in the road prism.

The internal reticulation will consist of 450mm diameter to 825mm diameter stormwater mains.

Stormwater Management Plan

The site has an approximate area of 3 000 000 m^2 and must be retained with the required capacity of 77521m^3 of stormwater and release it at a maximum rate of 60.42m^3/s. See Annexure D for calculations and retention position.

Flood line

The 1:100 flood line do not cross any of the proposed erf boundaries as per the Flood line report in Annexure F.

4.4 Roads

The access to the development will be from the Provincial road which is the R544 which runs through the development and access will be allowed for from the R544. The necessary applications with the Department of Roads and Public Works will be done in ensuring that access to the development meets with the department's requirements. The roads within the development will be 5m – 5.5m wide with premix surfacing and brick paving or slurry surfaced sidewalks.

4.5 Solid waste management

Solid waste must be collected from the development on weekly basis by the Emalahleni Local Municipality (ELM) and must be dumped at a nearest registered dumping site.

4.6 Electricity

The new development will require 16 925kVA to be available from the Emalahleni Local Municipality 11kV distribution system. There has been some contact with the ELM in order to get the existing electrical capacity and determin wether the demand will be ment by the existing capacity.

The estimated After Diversity Maximum Demand for the development is as follows:

Description	Area	Demand per unit	Total demand
Single Residential Erven	8000units @150m²	3kVA / unit	24 000kVA
Business Erf	2069 m²	50VA/m²	103kVA
Church	1000 m²	25kVA	25kVA
Schools	8000 m²	25kVA	25kVA
Taxi rank	1000 m²	25VA/ m²	25kVA
Public open space	20000 m²	0	0
Total			24 178 kVA
Diversity Factor:			0.7
After Diversity Demand			16 925kVA

5 SERVICES COST

The estimated service cost for the water, sewer, roads and electricity are attached in Annexure A. This does not include municipal connections fees.

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***For* Monde consulting Engineers**

ANNEXURE A

COST ESTIMATE

ANNEXURE B

SERVICES LAYOUT

ANNEXURE C

STORMWATER MANAGEMENT