ANNEXURE D– SERVICES REPORT

Tshawe Infrastructure Technologies
Civil & Structural Eng, Project Management & Capacity Building

SERVICE REPORT

FOR

ERF 24460 IN
DIEPKLOOF ZONE 6

SEPTEMBER 2015

REPORT PREPARED FOR:
TURNING POINT PROJECT MANAGEMENT

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1 INTRODUCTION AND TERMS OF REFERENCE

Tshawe Infrastructure Technologies has been assigned to assess the Engineering Infrastructure Capacity for the proposed development.

This report will address the Bulk Engineering Services available for the proposed development to be defined on completion of the worked demand study. The current and future demand capacity of the following will be addressed:

- Water Provision and Sanitation (current and future demand)
- Stormwater and road network

The main Objectives of this report are:

- To determine the existing Bulk Infrastructure will accommodate one of the following developments, Residential, Office block or Retail
- To determine the point of connections to reticulations network
- To present overall scenario and present Bulk Engineering services solutions

2. SITE DESCRIPTION

The proposed site is in Diepkloof within the City Of Johannesburg jurisdiction the site can be accessed via Chris Hani Road joining into Mohlala Street and Khambule Street where the access to the site is proposed. The proposed site is 3000m2 (0.3Ha) in size, currently has no buildings on site and the co-ordinates of the site are 26°15'27.72" S; 27°56'30.27" E. The site is in a developed area with existing services such as sewer network, water network, roads and storm water management.

Erf 24460 is also in close proximity to amenities such as shopping centers, medical institutions and transportation nodes.

Figure 1 – Locality map Erf 24460 Diepkloof

3. POPULATION FORECASTING

The Diepkloof Zone 6 area is densely populated comprising of institutional facilities, business and residential with low to medium income, the population in Diepkloof Zone 6 (ward 26) is 25365 with an estimated annual average water demand of 15 851 (kl/day) in the Diepkloof area.

4. EXISTING INFRASTRUCTURE

The design will be incorporated to the existing services, if there is a need, the existing services will be upgraded to meet the demand of the development, while ensuring that the bulk distribution and storage infrastructure are not over exerted as a result of the designs. All applicable laws and regulations relating to public health and safety and zoning will be adhered to and the specifications of each authority will be considered during the detailed design phase. Handicap accessibility standards as prescribed by all the relevant authorities will be adhered to.

The design will meet all the requirements of all the authorities within the jurisdiction of the City Of Johannesburg. The water and sanitation requirements will be in compliance with the "Johannesburg water Guidelines and standards for the design and maintenance of water and sanitation services".

4.1 Water Reticulation (Current Water)

Existing Water District AADD

Feature type	Water pipes
Number	332810
Diameter	150mm
Length	137m
Elevation	Us 1.659.9m/Ds 1.653.5m
Static head	Us 62.4m/Ds 68.8m
Peak head	Us 52.2m/Ds 58.5m
Peak Row	2.50l/s
Peak Velocity	0.14m/s
System	Diepkloof Reservoir

Water Reticulation (Future Water)

Feature type	**Water pipes**
Number	**335452**
Diameter	**150mm**
Length	**137m**
Elevation	**Us 1.659.9m/Ds 1.653.5m**
Static head	**Us 63.8m/Ds 69.2m**
Peak head	**Us 42.0m/Ds 48.4m**
Peak Row	**1.7l/s**
Peak Velocity	**0.1m/s**
System	**Diepkloof Reservoir**

Water reticulation design will be based on the current capacity in the area, the current system which the Diepkloof reservoir is supplied through a 1.7 km long 700mmø bulk pipeline from Rand Water Connection 2179. The present AADD is 15 851 kl/day. The 700mm diameter bulk pipeline can supply the required flow rate of 1.5 X AADD 9275 (l/s) at a velocity of 0.97 m/s which is within the acceptable limit, therefore indicating that spare capacity is available. The site is serviced by a 30 Ml reservoir (Diepkloof reservoir).

The average reservoir storage, 26 X AADD, the current reservoir capacities are therefore adequate to supply the ultimate demands. Provisions for future water demand in the area have been made, the estimated future demand is based on a 5 year cycle from the base line year 2009, and as such the current supply will be sufficient to meet the estimated demand of the development. The elements water distribution and storage system consist of adequate bulk water transmission systems such as bulk-storage reservoirs, intermediate-storage reservoirs and distribution networks.

Connection of the proposed developments water reticulation network to the bulk supply line will be done upon capacity approval from Johannesburg water (JW). The estimated demand for the development is to be calculated with the guidelines of the "Johannesburg water Guidelines and standards for the design and maintenance of water and sanitation services" and "CSIR's Guidelines for Human settlement planning and design".

Water Connection

The proposed developments water connection point can be on corner Mohlala Street and Khambule Street. The area does not have a fire hydrant therefore a new one would have to be provided next to the proposed development.

Figure 2 – Future Water Demand in the area

Figure 3 – Joburg Water Connection next to the site

4.2 Sewer Reticulation

Sewer Reticulation (Current Sewer)

Feature type	Water pipes
Code	4-07-02-10163
Diameter	150mm
Length	78m. slope 1 in 202 (min slope)
Inverts	No data
Full velocity	0.65m/s
Capacity	11.5l/s
Max flow	0.8m/s
Spare capacity	Abs: 93.3%. Rel: 93.3%
System	Ret- Power Park

Sewer Reticulation (Future Sewer)

Feature type	Water pipes
Code	4-07-02-10163
Diameter	150mm
Length	78m. slope 1 in 202 (min slope)
Inverts	No data
Full velocity	0.65m/s
Capacity	11.5l/s
Max flow	0.9l/s
Spare capacity	Abs: 91.9%. Rel: 91.9%
System	Ret- Power Park

Diepkloof sewer management plan falls under the Southern (Diepkloof) sub-basin, the sub-basin serves certain portion of the Diepkloof area, the sub-basin slopes in a north westerly direction and is served by the Diepkloof link outfall which originates in Diepkloof as a 300mmø sewer. There is a 150mmø sewer collector pipes running on the perimeter of the site with 3 (three) possible sewer connection points.

The 300mmø collector pipe discharges waste material into the 1050mmø outfall. The outfall increases to a 1657 mmø sewer downstream before connecting to the BKP2 tunnel. The North Westerly outfall drains to the Bushkoppies waste water

treatment works (WWTW). The Bushkoppies WWTW has a capacity of 220 Ml/day. The estimated sewer demand for the development is calculated with the guidelines of the "Johannesburg water Guidelines and standards for the design and maintenance of water and sanitation services" and the "CSIR's Guidelines for Human settlement planning and design"

Figure 4 – Future Sewer Demand in the Area

Sewer Connection

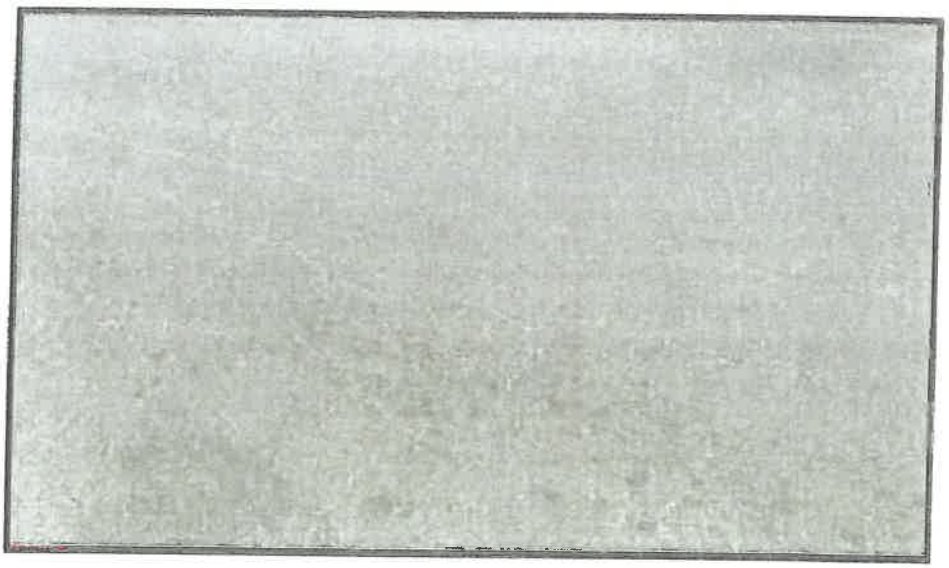
There is an existing sewer connection behind the shop adjacent the proposed development that would have to be refurbished and or repaired as the need requires.

Figure – 5 Existing Connection Point

5.3 Road network

There are major roads surrounding the site, minor upgrading may be required for this development mostly in the area where the traffic will enter and exit the property. The traffic flow will be analysed and the roads may need upgrading in order to meet the traffic loading. The access roads and internal roads of the development will meet the requirements of the "SANRAL Geometric Guidelines", the turning radii, design speed and vehicle dimensions will be in accordance with the manual.

The roads may need to be refurbished in order to cater for the new development



The road on Mohlala Street may need to be converted into a three way stop to accommodate the new development and for effective traffic control.

5.4 Storm water management and reticulation

An internal storm water management system will be provided for the catchment area of the Diepkloof zone 6 ERF 24460 development to drain the surface runoff from the development to the JRA storm water infrastructure. The design parameters for the development will allow an integration of the internal drainage system of the development and the JRA storm water system. The surface runoff on the parking will be drained by catch pits and grid inlets, and the roof runoff will be drained by the gutters and down pipes, all of this runoff will then be discharged into the internal storm water channels (or storm water pipes) and from there the runoff will be discharged into the JRA bulk storm water system.

There are existing stormwater drainage points next to the proposed development.

6. Conclusion

The yields of this network may be sufficient as the site is a developed area with storage, distribution infrastructure and future water and sewer demand allowance.

The Client will have to conduct a market study to determine a suitable development, from which the final requirement will be determined by the type and size of the development and therefore recommend that any cost estimates be deferred until the full extent of the development is known.