

ANNEXURE I



OUTLINE SCHEME REPORT
FOR
ERF159/319-IQ
DIEPKLOOF EXTENSION 16 DEVELOPMENT

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REPORT PREPARED FOR:
TURNING POINT PROJECT
MANAGEMENT

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1. INTRODUCTION

Tshawe Infratructure Technologies has been appointed to assess the capacity of the existing Bulk Engineering Infrastructure for the accommodation of the proposed development called Diepkloof Extension 16 Development.

The main objectives of this report are:

- ❖ To asses the existing capacity for the Bulk Infrustructure
- ❖ To determine the future demand of the proposed development
- ❖ To asses how the existing infrastructure will be affected by the proposed development

Tshawe Infrastructure Technologies will address bulk engineering services available for the proposed development, namely;

- ❖ Water Reticulation
- ❖ Sewer Reticulation
- ❖ Road and storm water

Property Description:

The proposed site is ERF 159/319-IQ is in Diepkloof within the City Of Johannesburg jurisdiction called the Diepkloof Extension 16 development. The site is in a developed area with existing services such as sewer network, water network, roads and storm water management

Locality:

The proposed site is an existing Soweto Empowerment Zone erf, co-ordinates of the site are 26°15'40.68" S; 27°57'02.59" E. It can be accessed via Chris Hani Road and also along Collinder Road.

ERF 159/319-IQ is also in close proximity to amenities such as shopping centers, medical institutions and transportation nodes.



Size of Property:

The total size to be developed measures approximately 304700.99m²(30.47Ha) with grid layout proposed for the development.

Proposed Land use of proposed site is as follows:

ZONING	ERF NO.	AREA(Ha)	% OF AREA
BUSINESS 1	1,2,14	4.0064	13.1
BUSINESS 4	3	2.9309	9.6
RESIDENTIAL 4	4-7,9-11	12.9304	42.4
EDUCATIONAL	12,13	4.2078	13.8
EXISTING.PUBLIC ROAD		5.7593	18.9
PUBLIC SPACE	8	0.6944	2.3
TOTA AREA OF THE SITE		30.5292	100

The land use zones provide demarcated areas of proposed future development, as integral to the role and function of the precinct. The aim of the zones is not to be prescriptive but to promote a mix of land uses.



**Physical Features:**

Over half of the land is vacant or occupied with temporary structures. The properties are not subject to any Heritage restrictions.

SITE DEVELOPMENT PLAN:**Facilities of the proposed development:**

- ❖ Mixed income housing
- ❖ Municipal services
- ❖ Clinics and other community facilities
- ❖ Cultural and educational facilities
- ❖ Public squares and recreational facilities

2. TERMS OF REFERENCE

Tshawe infrastructure Technologies appointment is to assess the capacity of the existing bulk Engineering Infrastructure for the proposed housing development.

The main objectives of this report are therefore:

- ❖ To determine the demands for the proposed development
- ❖ To determine if the existing bulk infrastructure will accommodate the demand
- ❖ To determine the point of connection to the reticulation networks
- ❖ To present overall scenario and present bulk engineering services solution.

This report will not include the detail designs on the possible solutions. The opted solutions will be detailed at Detail Design Stage

3. LEVEL OF SERVICES

The design parameters utilised to calculate the demand and requirements for civil Services for this report are in accordance with the Guidelines for the Human Settlement Planning and Design compiled by the Department of Housing and Construction Technology and other approved design specifications.

4. TOPOGRAPHICAL INFORMATION

A detailed topographical survey will be conducted, the contours on the survey will indicate topographical information accurate enough for the detailed design.

5. ECOLOGY/ENVIRONMENT INFORMATION

A detailed environmental and ecological details will be available in the Environmental Impact Assessment report for the proposed development.

6. EXISTING BULK INFRASTRUCTURE

The following bulk services are being addressed in this engineering report:

- ❖ Water provision and Sanitation
- ❖ Roads and Stormwater drainage

Limited calculation to determine the demand for the various services were prepared to obtain an indication of the size of the bulk services. The actual sizes of the bulk services will have to be determined through a final design process after the relevant details, final site layout plan size and coverage of the units of the various land uses, number of units etc have been finalised.

POPULATION FORECASTING

The proposed development has different zonings within the site i.e residential, business, industrial, community facilities with an annual average water demand of 1 000 (l/day) upper limit and 600(l/day) lower limit. The area is densely populated comprising of institutional facilities, business and residential area with low to medium income, the population in Diepkloof Zone 6 (ward 24) has an estimated annual average water demand of 15 851 (kl/day) in the Diepkloof area.

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".

6.1 PORTABLE BULK WATER SUPPLY

The proposed site is bordered by developed areas.

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 total estimated water demand for the proposed development is 1580kl/d taking into consideration 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 DEMANDS FOR PROPOSED DEVELOPMENT

ERF NO	ZONING	ERF SIZE (m ²)	FAR	FLOOR AREA (m ²)	DENSITY (DU/HA)	UNIT SIZE (m ²)	DWELLING UNITS	AADD(kl/d)	PEAK FACTOR	PEAK DEMAND FLOW(l/s)
1	Residential 4	13749	1,8	24748	100	60	137,49	46,75	4	2,16
2	Residential 4	23111	1,8	41600	100	60	231,11	78,6	4	3,64
3	Residential 4	29302	1,8	52744	100	60	293,02	99,63	4	4,61
4	Residential 3	12247	1,5	18371	150	100	183,705	99,2	4	7,89
5	Residential 3	12247	1,5	18371	150	100	183,705	99,2	4	7,89
6	Residential 3	7663	1,5	11495	150	100	114,945	62,07	4	4,94
7	Residential 4	29546	2	59092	250	80	738,65	342,73	4	11,9
8	Public Open Space	6944	0,2	1389	0	-	-	-	-	-
9	Residential 4	33086	2	66172	250	80	827,15	383,8	4	13,326
10	Residential 4	20751	2	41502	250	80	518,775	240,71	4	13,38
11	Residential 4	13739	1,2	16487	100	120	137,39	95,62	4	4,43
12	Educational	36832	0,4	14733	0	-	-	11,2	4	0,52
13	Educational	5236	0,4	2094	0	-	-	10	4	0,46
14	Business 1	3194	0,6	1916	0	-	-	10,54	4	0,49
Roads	Public Road	57593	0	0	0	-	-	-	-	-
TOTALS		305240 (m²)		370712			3366	1580		76

Total Fire Flow (L/s)	Min. Flow For Each Hydrant (L/s)	Minimum Residual Pressure at Fire node (m)	Duration of Fire (Hours)	Spacing of Hydrants
50	25	15	4	180m max
Fire flow requirement to be determined by a qualified Professional Fire Engineer.				

Water Connection

There are water connection points along Chris Hani Road and inside the proposed development area.

Future water demand in the area



Proposed bulk connection along Chriss Hani Road

6.2 SEWER RETICULATION

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 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 estimated at 1264kl/d taking into consideration "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" to be finalized on the detailed design.

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

SEWER INFLOWS FOR PROPOSED DEVELOPMENT

ERF NO	PROPOSED ZONING	ERF SIZE (m ²)	FAR	FLOOR AREA (m ²)	DENSITY (DU/HA)	UNIT SIZE (m ²)	DWELLING UNITS	ADDWF(kl/d)	Peak Factor	Extraneous flow(kl/d)	PWWF(l/s)
1	Residential 4	13749	1,8	24748,2	100	60	137	37,4	2,3	5,6	2,16
2	Residential 4	23111	1,8	41599,8	100	60	231	62,88	2,3	9,4	1,78
3	Residential 4	29302	1,8	52743,6	100	60	293	79,704	2,3	12,0	2,26
4	Residential 3	12247	1,5	18370,5	150	100	184	79,36056	2,3	11,9	2,25
5	Residential 3	12247	1,5	18370,5	150	100	184	79,36056	2,3	11,9	2,25
6	Residential 3	7663	1,5	11494,5	150	100	115	49,65624	2,3	7,4	1,41
7	Residential 4	29546	2	59092	250	80	739	274,18688	2,3	41,1	7,77
8	Public Open Space	6944	0,2	1388,8	-	-	-	-	-	-	-
9	Residential 4	33086	2	66172	250	80	827	307,03808	2,3	46,1	8,71
10	Residential 4	20751	2	41502	250	80	519	192,56928	2,3	28,9	5,46
11	Residential 4	13739	1,2	16486,8	100	120	137	76,498752	2,3	11,5	2,17
12	Educational	36832	0,4	14732,8	-	-	-	8,96	2,3	1,3	0,25
13	Educational	5236	0,4	2094,4	-	-	-	8	2,3	1,2	0,23
14	Business 1	3194	0,6	1916,4	-	-	-	8,432	1,3	1,3	0,14
Roads	Public Road	57593	-	-	-	-	-	-	-	-	-
TOTAL		305240 (m²)		370712			3366	1264			37

6.3 ROAD NETWORK

There are major roads surrounding the site, minor upgrading may be required for this proposed 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 have proposed road reserve ranging from 10m to 25m which will meet the requirements of the "SANRAL Geometric Guidelines", the turning radii, design speed and vehicle dimensions will be in accordance with the manual. A traffic count that will be conducted indicating a traffic statement required due to the traffic loading in the area

The Collinder road will need to be rehabilitated in order to cater for the new development.

6.4 STORM WATER MANAGEMENT AND RETICULATION

An internal storm water management system will be provided for the catchment area of the ERF 159/319-IQ development to drain the surface runoff from the development to the JRA storm water infrastructure.

The design parameters for the proposed 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.

Analysis and investigations on the catchment area will be conducted to ensure that the proposed storm water management plan is viable. The actual required capacity will be analysed and submitted once the catchment analysis and investigations have been concluded.

The final detailed designs will be based on Johannesburg Road Agency storm water modeling guidelines. Storm water pipes varying in diameter between 400 and 1200mm dia will be used to drain storm water from the internal storm water drains to the existing water drainage.