






# PROPOSED MOTOR DEALERSHIP ON PORTIONS 59 AND 168 OF THE FARM BULTFONTEIN 533-JQ CITY OF JOHANNESBURG







## BULK SERVICES REPORT-Water, Fire & Sewer March 2019

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## Quality Control

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### Certification

*It is herewith certified that this Services Report has been prepared according to requirements of the City of Johannesburg Water and Sanitation Standards.*

Signatory:



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### Quality checklist

Items	Initial
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# Contents

<b>1</b>	<b>Introduction</b>	<b>5</b>
1.1	Background	5
<b>2</b>	<b>Purpose of the Report</b>	<b>6</b>
<b>3</b>	<b>Site Appraisal: Pre-Development</b>	<b>7</b>
<b>4</b>	<b>Details of the Proposed Development</b>	<b>9</b>
<b>5</b>	<b>Existing Water, Fire and Sewer Services</b>	<b>15</b>
5.1	Existing Water and Fire	15
5.2	Existing Sewer	15
<b>6</b>	<b>Design Standards</b>	<b>16</b>
<b>7</b>	<b>Proposed Water and Fire Services</b>	<b>17</b>
7.1	Water Sources	17
7.2	Water Demand	17
7.3	Fire Water Demand	19
7.4	Pipe Size and Material	19
7.5	Water and Fire pressure	20
7.6	Fire Hydrants	21
<b>8</b>	<b>Proposed Sewer Services</b>	<b>22</b>
8.1	Sewer Flow	22
8.2	Sewer Reticulation - Pipe Size and Material	23
8.3	Sewer Manholes	23
8.4	Sewer Conservancy Tank	23
8.5	Grey water reuse	23
8.6	Sand, Oil & Grease Traps	24
<b>9</b>	<b>Conclusions and Recommendations</b>	<b>25</b>
<b>10</b>	<b>References</b>	<b>27</b>



## Appendix A

- Drawing C339-WSEW-LO-01-Water and Sewer Layout Plan

## Appendix B

- Johannesburg Municipality Water and Sewer GIS information (Existing network planning)
- Johannesburg Municipality Water and Sewer GIS Information (Future network planning)



# 1 Introduction

## 1.1 BACKGROUND

CHRISEN CONSULTING (PTY) LTD Civil Engineers have been appointed by 4 WHEEL DRIVE PROPERTY HOLDINGS (PTY) LTD to undertake a services report to address Water, Fire and Sewer service for the proposed Motor Dealership on Portions 59 and 168 (Lanseria Extension 77 and 74) of the Farm Bultfontein 533-JQ. The site is located 2,5 km south from Lanseria Airport, at the north-eastern quadrant of the intersection of Pelindaba Road (R512) and 6th Road (R552) and falls within the City of Johannesburg area of jurisdiction. The site has recently been rezoned from “Agricultural Holdings” to “Industrial.” The site locality plan is illustrated on **Figure 1**.



**Figure 1: Locality plan**



## 2 Purpose of the Report

This study forms part of Environmental Authorisation submission for the proposed Motor Dealership on Portions 59 and 168 (Lanseria Extension 77 and 74) of the Farm Bultfontein 533-JQ, City of Johannesburg.

This report will address the Water, Fire and Sewer infrastructure. The purpose of this report is to evaluate the existing services effected by the development, calculate the proposed demands and discharges and recommend the associated infrastructure to cater for the intended usage.



### 3 Site Appraisal: Pre-Development

This section describes the site in its existing condition i.e. Pre-Development state. **Figure 2** depicts the site extent with its general surrounds. **Figure 3** depicts the Existing Site Characteristics in more detail.



**Figure 2: Site extent**

The 23,93 ha site is demarcated by the boundary line indicated (yellow). Pelindaba Road (R512) is a major arterial dual carriageway road having two lanes in each direction and runs in a north-south alignment pass the western boundary of the site. 6<sup>th</sup> Road (R552) is a major arterial dual carriageway road having two lanes in each direction and runs in a west-east alignment pass the southern boundary of the site.

The site is moderately sloped with a gradient of approximately 1:24 (4%) falling from east to west direction. The site is largely covered with a mix of light grass and sandy patches.



Figure 3 which follows depicts the site characteristics in more detail.



Figure 3: Existing site characteristics





## 4 Details of the Proposed Development

The total site area is 23,93 ha. The proposed motor dealership development will comprise of the following: Car Prep Centre, Hino Truck Dealership, Toyota Car Dealership, Used Vehicle Show Room, Taxi Dealership, Car Rental, 4X4 Mega World, Wash Bay Facilities, External Store, Guard House, Refuse Area and Parking Bays. Refer to **Table 1** below:

**Table 1: Development Extent for the proposed Motor Dealership on Portions 59 and 168 of the Farm Bultfontein, 533-JQ**

BUILDINGS					
TOYOTA					
	Description	Area	Coverage	FAR	Parking Required
<b>Ground Floor</b>	New Vehicle Showroom	995	995	995	40
	Sales Offices/ Administration/ Office/ Customer area	900	900	900	36
	Ablutions	120	120	120	5
	Parts Store	460	460	460	23
	Active Reception	334	334	0	13
	Workshop	1482	1482	1482	59
	Used Vehicle showroom	710	710	710	28
<b>First Floor</b>	Parts	460	460	460	23
	Administration	820	820	820	33
	Canteen and changerooms	334	334	334	13
<b>External</b>	Open Covered Display Area	1009	1009	0	0
	Wash bay	411	411	411	0
	External store	30	30	30	0
	Guard house	0	0	0	0
	Refuse area	30	30	30	0



Parking Bays Required					<b>274</b>
Parking Bays Provided					<b>513</b>
<b>TOTALS</b>		<b>8095</b>	<b>8095</b>	<b>6752</b>	
<b>USED VEHICLE SHOWROOM</b>					
	<b>Description</b>	Area	Coverage	FAR	Parking Required
<b>Ground Floor</b>	Used Vehicle Showroom	5505	5505	5505	220
	Sales Offices/ Administration/ Office/ Customer area	544	544	544	22
	Ablutions	100	100	100	4
	Parts Store	0	0	0	0
	Active Reception	0	0	0	0
	Workshop	0	0	0	0
<b>External</b>	Open Covered Display Area				
	Wash bay	0	0	0	0
	External Store	411	411	411	0
	Guard House	30	30	30	0
	Refuse	0	0	0	0
Parking Bays Required					<b>246</b>
Parking Bays Provided					<b>118</b>
<b>TOTALS</b>		<b>6620</b>	<b>6620</b>	<b>6620</b>	
<b>HINO</b>					
	<b>Description</b>	Area	Coverage	FAR	Parking Required
<b>Ground Floor</b>	Open Showroom	417	417	417	17
	Sales Offices/ Administration/ Office/ Customer area	250	250	250	10
	Ablutions	192	192	192	8
	Parts Store	142	142	142	7
	Active Reception	0	0	0	0
	Workshop	1100	1100	1100	44
	Used Vehicle showroom	0	0	0	0
<b>First Floor</b>	Parts	70	70	70	4
	Administration	194	194	194	8



	Canteen and changerooms	80	80	80	3
<b>External</b>	Open Covered Display Area	1406	1406	0	0
	Wash bay	240	240	240	0
	External store	85	85	85	0
	Guard house	0	0	0	0
	Refuse area	30	30	30	0
Parking Bays Required					<b>100</b>
Parking Bays Provided					<b>198</b>
<b>TOTALS</b>		<b>4206</b>	<b>4206</b>	<b>2800</b>	
<b>TAXI DEALERSHIP</b>					
	<b>Description</b>	<b>Area</b>	<b>Coverage</b>	<b>FAR</b>	<b>Parking Required</b>
<b>Ground Floor</b>	New Vehicle Showroom	344	344	344	14
	Sales Offices/ Administration/ Office/ Customer area	197	197	197	8
	Ablutions	53	53	53	2
	Parts Store	41	41	41	2
	Active Reception	103	103	0	4
	Workshop	1027	1027	1027	41
	Used Vehicle showroom	0	0	0	0
<b>First Floor</b>	Parts	20	20	20	1
	Administration	297	297	297	12
	Canteen and changerooms	400	400	400	16
<b>External</b>	Open Covered Display Area	0	0	0	0
	Wash bay	329	329	329	0
	External store	82	82	82	0
	Guard house	0	0	0	0
	Refuse area	30	30	30	0
Parking Bays Required					<b>100</b>
Parking Bays Provided					<b>131</b>



<b>TOTALS</b>		<b>100</b>	<b>100</b>	<b>100</b>	
<b>CAR PREP CENTRE</b>					
	<b>Description</b>	Area	Coverage	FAR	Parking Required
<b>Ground Floor</b>	New Vehicle Showroom	0	0	0	0
	Sales Offices/ Administration/ Office/ Customer area	200	200	200	8
	Ablutions	83	83	83	3
	Parts Store	100	100	100	5
	Active Reception	0	0	0	0
	Workshop	2358	2358	2358	94
	Used Vehicle showroom	0	0	0	0
<b>First Floor</b>	Parts	20	20	20	1
	Administration	0	0	0	0
	Canteen and changerooms	0	0	0	0
<b>External</b>	Open Covered Display Area	0	0	0	0
	Wash bay	329	329	329	0
	External store	82	82	82	0
	Guard house	0	0	0	0
	Refuse area	30	30	30	0
Parking Bays Required					<b>112</b>
Parking Bays Provided					<b>630</b>
<b>TOTALS</b>		<b>3202</b>	<b>3202</b>	<b>3202</b>	
<b>CAR RENTAL</b>					
	<b>Description</b>	Area	Coverage	FAR	Parking Required
<b>Ground Floor</b>	New Vehicle Showroom	0	0	0	0
	Sales Offices/ Administration/ Office/ Customer area	710	710	710	28
	Ablutions	53	53	53	2
	Parts Store	0	0	0	0
	Active Reception	0	0	0	0
	Workshop	0	0	0	0
	Used Vehicle showroom	0	0	0	0



<b>First Floor</b>	Parts	0	0	0	0
	Administration	150	150	150	6
	Canteen and changerooms	53	53	53	2
<b>External</b>	Open Covered Display Area	0	0	0	0
	Wash bay	277	277	277	0
	External store	77	77	77	0
	Guard house	0	0	0	0
	Refuse area	30	30	30	0
Parking Bays Required					<b>39</b>
Parking Bays Provided					<b>175</b>
<b>TOTALS</b>		<b>1350</b>	<b>1350</b>	<b>1350</b>	
<b>4x4 MEGAWORLD</b>					
	<b>Description</b>	Area	Coverage	FAR	Parking Required
<b>Ground Floor</b>	New Vehicle Showroom	0	0	0	0
	Sales Offices/ Administration/ Office/ Customer area	196	196	196	8
	Ablutions	53	53	53	2
	Parts Store	54	54	54	3
	Active Reception	0	0	0	0
	Workshop	380	380	380	15
	Used Vehicle showroom	0	0	0	0
	<b>First Floor</b>	Parts	0	0	0
Administration		150	150	150	6
Canteen and changerooms		53	53	53	2
<b>External</b>	Open Covered Display Area	0	0	0	0
	Wash bay	91	91	91	0
	External store	30	30	30	0
	Guard house	0	0	0	0
	Refuse area	30	30	30	0
Parking Bays Required					<b>36</b>
Parking Bays Provided					<b>47</b>



<b>TOTALS</b>	<b>1037</b>	<b>1037</b>	<b>1037</b>	
<b>GRAND TOTAL</b>	27433	27433	24581	
	12.77%	12.77%	11.44%	
<b>SITE AREA</b>				<b>214 802</b>
<b>PARKING REQUIRED</b>				906



## 5 Existing Water, Fire and Sewer Services

### 5.1 EXISTING WATER AND FIRE

There are existing water and firefighting infrastructure in the vicinity of the site. The closest existing water pipe (160 mm dia AC) is situated along the access road approximately 16 m away from the northern boundary of Ptn 59 of the Farm Bultfontein, 533-JQ. This existing line tees off from a 300 mm dia AC pipe situated a further 500 m away in an easterly direction. The 300 mm dia line then runs in a southern direction adjacent the eastern boundary of the site some 750 m away. Existing GIS information received from Johannesburg water indicate these lines have the following hydraulic conditions:

**Table 2: Existing Hydraulic Conditions**

Parameter	Existing 160mm dia AC	Existing 300mm dia AC
Average Static Head	± 55.61m	± 63.07m
Average Head	± 54.08m	± 62.00m
Flow	± 3.09 l/s	± 25.26 l/s
Velocity	± 0.15 m/s	± 0.36 m/s

It is currently understood that the existing fire flow requirements for the area are also drawn of the existing water reticulation network. The GIS records of the existing and future water lines in the vicinity of the site can be found in **Appendix B**.

### 5.2 EXISTING SEWER

The nearest existing sewer line in the vicinity of the site is situated approximately 1.3 km away from the northern boundary of the site. However, there exists a natural low point in the terrain some 600 m from the northern boundary of the site and hence reticulating a new sewer line to tie into the existing line would not be possible. The GIS records of the existing and future sewer lines in the vicinity of the site can be found in **Appendix B**.



## 6 Design Standards

- The standards used in the design of the water, fire and sewer bulk services are the “Johannesburg Water: Guidelines and Standards For The Design And Maintenance Of Water And Sanitation Services”





## 7 Proposed Water and Fire Services

### 7.1 WATER SOURCES

Water will be required to service the proposed site. Water to the new site is proposed to be obtained by **either of the following**:

- Teeing off the existing 160 mm dia AC water pipe situated adjacent to the northern boundary of Ptn 59 of the Farm Bultfontein, 533-JQ as well as utilising the water from the existing Bore Hole. (It is recommended that the Bore hole be tested to determine its yield to determine if Bore hole water is sustainable with the development)
- A new 200 mm dia pipe is to be constructed along the northern side of Ptn 59 of the Farm Bultfontein, 533-JQ, and must tee off from the existing 300 mm Bulk Water pipe which is situated on the eastern boundary of the site some 500 m away. (Municipal supply capability to be confirmed)

### 7.2 WATER DEMAND

The following **Table 3** indicates the water demand of the proposed facilities.

- Development type: Business / Commercial



**Table 3: Water Demand for the proposed Motor Dealership on Portions 59 and 168 of the Farm Bultfontein, 533-JQ**

Proposed Facility	Characteristics	Unit Demand	Average Flow (kl/day)	Peak Factor	Peak Flow (l/s)
Toyota Building	Floor area of 7654 m <sup>2</sup>	0.26 kl/day per 100m <sup>2</sup> gross floor area	19.90	4	0.92
Hino Buildings	Floor area of 3936 m <sup>2</sup>	0.26 kl/day per 100m <sup>2</sup> gross floor area	10.23	4	0.47
Car Prep Building	Floor area of 2843 m <sup>2</sup>	0.26 kl/day per 100m <sup>2</sup> gross floor area	7.39	4	0.34
Used vehicle show room	Floor area of 6179 m <sup>2</sup>	0.26 kl/day per 100m <sup>2</sup> gross floor area	16.07	4	0.74
Taxi dealership	Floor area of 2564 m <sup>2</sup>	0.26 kl/day per 100m <sup>2</sup> gross floor area	6.67	4	0.31
Car rental	Floor area of 1043 m <sup>2</sup>	0.26 kl/day per 100m <sup>2</sup> gross floor area	2.71	4	0.13
4x4 Mega world	Floor area of 1043 m <sup>2</sup>	0.26 kl/day per 100m <sup>2</sup> gross floor area	2.38	4	0.11
Wash bays: Cars + Taxis_80 vehicles per day	Floor area of 1848 m <sup>2</sup>	40 l/vehicles, 5 l/m <sup>2</sup> for wash down	12.44	4	0.58
Wash bays: Trucks_10 vehicles per day	Floor area of 240 m <sup>2</sup>	80 l/vehicles, 5 l/m <sup>2</sup> for wash down	2.00	4	0.09
Guard House_4 persons per 24 hr	Floor area of 9 m <sup>2</sup>	30 l/person/day	0.120	4	0.01
Refuse area	Floor area of 210 m <sup>2</sup>	5 l/m <sup>2</sup> for wash down	1.05	4	0.05
Grease& Oil wash down areas_ allowance for 150m <sup>2</sup>	Floor area of 150 m <sup>2</sup>	5 l/m <sup>2</sup> for wash down	0.75	4	0.03
<b>TOTALS</b>			<b>81.71 kl/day</b>		<b>3.79 l/s</b>



**Grey water recycling plants** are anticipated for the car wash and truck wash areas. After the initial priming of the system, the **total average water demand would reduce to 67,27 kl/d and the peak water demand would reduce to 3,12 l/s.**

### 7.3 FIRE WATER DEMAND

The following **Table 4** indicates the Fire water demand of the proposed facilities.

**Table 4: Fire Water Demand for the proposed Motor Dealership on Portions 59 and 168 of the Farm Bultfontein, 533-JQ**

Fire Risk Category	Total Fire Flow (L/s)	Min. Flow For Each Hydrant (L/s)	Duration of Fire (Hours)	Spacing of Hydrants
Moderate Risk 1 Business, Commercial	50	25	4	180 m max

### 7.4 PIPE SIZE AND MATERIAL

The ultimate scenario (although unlikely) would be a combined demand: Peak flow + Fire flow = 53,96 l/s. With a design fire duration of 4 hours supplemented by the rare/low probability recurrence interval, the pipeline could withstand higher velocities without suffering significant scour damage. Hence:

For the main tie in line to the proposed 160 mm feeder line:

- Design velocity during combined flow scenario = 2.68 m/s

Use 160 mm dia. CI16 mPVC ( $Q_{v=2.68}=53.96$  l/s)

Proposed water connection to Portions 59 and 168 (Lanseria Extension 77 and 74) of the Farm Bultfontein 533-JQ is 160 mm dia pipe and which can step down to a 110 mm dia pipe.

For the main reticulation lines feeding the hydrants:

The flow can be split to reticulate to the different hydrant locations, hence

- Design velocity during combined flow scenario = 1.13 m/s

Use 110 mm dia. CI16 mPVC ( $Q_{v=1.13}=10.792$  l/s)



**Table 5: Distribution Lines to the various points**

Proposed Facility	Peak Flow (l/s)	Design Velocity (m/s)	Recommended Pipe
Toyota Building	0.92	0.7	50 HDPE PE100 PN12.5
Hino Buildings	0.47	0.7	32 HDPE PE100 PN12.5
Car Prep Building	0.34	0.7	32 HDPE PE100 PN12.5
Used Vehicle Show Room	0.74	0.7	32 HDPE PE100 PN12.5
Taxi dealership	0.31	0.7	32 HDPE PE100 PN12.5
Car rental	0.13	0.7	25 HDPE PE100 PN12.5
4x4 Mega world	0.11	0.7	25 HDPE PE100 PN12.5
Car Wash	0.71	0.7	32 HDPE PE100 PN12.5
Truck Wash	0.13	0.7	25 HDPE PE100 PN12.5

Construction shall be in accordance with the Johannesburg Water guidelines and the relevant SANS1200 guidelines.

## 7.5 WATER AND FIRE PRESSURE

The minimum static pressure required for water supply is 20m head ie. 2 bars. Ideal supply pressure should range between 25m - 90m head ie. 2.5 - 9 bars. The minimum residual head required for fire scenario is 15m (1.5 bars) at any connection.

The existing line which the proposed connection shall tee off is at an elevation of  $\pm 1377$ msl and operates under a static head of  $\pm 63$ m with peak supply head of  $\pm 62$ m. The proposed development will also be at a lower elevation than the existing water line hence gaining static head. These satisfy the above static and supply head requirements. Hence, there is sufficient pressure in the system to service the proposed development.



## 7.6 FIRE HYDRANTS

Five (5 no.) fire hydrants are proposed. The fire hydrants shall be spaced at a maximum of 180m apart.



## 8 Proposed Sewer Services

### 8.1 SEWER FLOW

The following **Table 6** indicates sewer flow from the proposed ablutions and kitchen areas of the various buildings.

**Table 6: Sewer Demand for the proposed Motor Dealership on Portions 59 and 168 of the Farm Bultfontein, 533-JQ**

Proposed Facility	Characteristics	Unit Demand	Average Flow (kl/day)	Peak Factor	Peak Flow (l/s)
Toyota Building	floor area of 7654m <sup>2</sup>	0.16 kl/day per 100m <sup>2</sup> gross floor area	12.25	1.5	0.21
Hino Buildings	floor area of 3936m <sup>2</sup>	0.16 kl/day per 100m <sup>2</sup> gross floor area	6.30	1.5	0.11
Car Prep Building	floor area of 2843m <sup>2</sup>	0.16 kl/day per 100m <sup>2</sup> gross floor area	4.55	1.5	0.08
Used Vehicle showroom	floor area of 6179m <sup>2</sup>	0.16 kl/day per 100m <sup>2</sup> gross floor area	9.89	1.5	0.17
Taxi Dealership	floor area of 2564m <sup>2</sup>	0.16 kl/day per 100m <sup>2</sup> gross floor area	4.10	1.5	0.07
Car rental	floor area of 1043m <sup>2</sup>	0.16 kl/day per 100m <sup>2</sup> gross floor area	1.67	1.5	0.03
4x4 Mega world	floor area of 916m <sup>2</sup>	0.16 kl/day per 100m <sup>2</sup> gross floor area	1.47	1.5	0.03
Guard House_4 persons per 24 hr	floor area of 9m <sup>2</sup>	30 l/person/day	0.12	1.5	0.001
<i>Sub Total</i>			<i>40.34 kl/day</i>		<i>0.70 l/s</i>
Allowance for extraneous flows			:	15% of peak (0.70) = 0.105 l/s	
<b>TOTAL DESIGN PEAK FLOW = 0.70 + 0.105 = 0.805 l/s</b>					



## 8.2 SEWER RETICULATION - PIPE SIZE AND MATERIAL

The required minimum pipe size is 160 mm diameter with a capacity calculated at 67% of depth of flow. The minimum gradient is 1:140 with a minimum full flow velocity of 0.7m/s. For these constraints the following is applicable:

- Capacity of the 160mm dia. pipe = 12.1 l/s (greater than design peak sewer flow of 0.805 l/s)
- Velocity in pipe at capacity flow = 0.96 m/s (greater than minimum full flow velocity of 0.7m/s)

The buildings will be reticulate with 110 mm pipes which will feed into the main 160 mm pipe, which will connect to the sewer conservancy tank.

Construction shall be in accordance with the Johannesburg Water guidelines and the relevant SANS1200 guidelines.

## 8.3 SEWER MANHOLES

These shall be 1,0 m nominal diameter precast concrete ring manholes placed at every change in gradient, junctions and horizontal direction. The maximum spacing of manholes is 80,0 m.

## 8.4 SEWER CONSERVANCY TANK

The sewer flow shall be reticulated to a conservancy tank which is designed to have a seven (7) day storage capacity (based on average flow) before requiring emptying. Hence, storage volume required =  $40.34 \text{ kl/d} * 7\text{days} = 282.38 \text{ kl}$  (ie.  $282.38 \text{ m}^3$ ). Hence 7 no. 44.5 kl Prefabricated plastic conservancy tanks ('Calcamite' or similar approved) are proposed with a combined storage volume of 311.5 kl.

## 8.5 GREY WATER REUSE

The Car Wash facility and Truck Wash facility are proposed to have Greywater Recycle Plants. A 10 kl Package Greywater Recycle Plant is proposed at the Car Wash facility ('Calcamite Grey Water 20' or similar approved) and a 5 kl Package Greywater Recycle Plant is proposed at the Truck Wash facility ('Calcamite Grey Water 10' or similar approved). Grey Water is drained via



grid inlets at the wash bays and returned into the recycling plant (intercepted by sand oil grease traps).

## **8.6 SAND, OIL & GREASE TRAPS**

The wash bay areas could experience grease and oil pollution. At the Car Wash Bay, area of 1848 m<sup>2</sup>, and at the Truck Wash Bay, area of 240 m<sup>2</sup>, it is anticipated that these areas will be washed down at least daily. The water used at the wash bays drained via grid inlets at the various locations and is reticulated via 300 mm dia. HD uPVC Class 34 pipes to Prefabricated traps viz. 2 no. 'Calcamite' 3 KL Sand, Grease and Oil Traps (or similar approved) at the Car Wash Bay and 2 no. 'Calcamite' 3 KL Sand, Grease and Oil Traps (or similar approved) at the Truck Wash Bay. These traps can then be emptied every as required.





## 9 Conclusions and Recommendations

The following conclusions and recommendations can be made based on the findings of this report:

- The report pertains to the Services report (water, fire and sewer) for the Proposed Motor Dealership on Portions 59 and 168 (Lanseria Extension 77 and 74) of the Farm Bultfontein 533-JQ.
- Water to the new site is proposed to be obtained by **either of the following**:
  - Teeing off the existing 160 mm dia AC water pipe situated adjacent to the northern boundary of Ptn 59 of the Farm Bultfontein, 533-JQ as well as utilising the water from the existing Bore Hole. (It is recommended that the Bore hole be tested to determine its yield to determine if Bore hole water is sustainable with the development)
  - A new 160 mm dia pipe is to be constructed along the northern side of Ptn 59 of the Farm Bultfontein, 533-JQ, and must tee off from the existing 300 mm Bulk Water pipe which is situated on the eastern boundary of the site some 500 m away. (Municipal supply capability to be confirmed)
- Proposed water connection to Portions 59 and 168 (Lanseria Extension 77 and 74) of the Farm Bultfontein 533-JQ is 160 mm dia pipe and which can step down to a 110 mm dia pipe.
- Water to service the various buildings is tee'd off from the new 110 mm dia. pipelines. Diameters of these distribution lines vary from 25 mm dia. HDPE PE100 PN12.5, 32 mm dia. HDPE PE100 PN12.5, 50 mm dia. HDPE PE100 PN12.5 up to 75 mm dia. HDPE PE100 PN12.5
- A minimum 110 mm diameter fire supply line will be required to supply 5no. of Fire hydrant for a fire duration of 4 hours operating at 25 l/s.
- The buildings will be reticulate with 110 mm dia sewer pipes which will feed into the main 160 mm dia sewer pipe, which will connect to the sewer conservancy tank
- Sewer Conservancy tank is proposed which is designed to have a seven (7) day storage capacity (based on average flow) before requiring emptying. Hence required volume of 282.38 kl. Prefabricated plastic conservancy tanks, 7no. 44.5 kl ('Calcamite' or similar approved), are proposed with a combined storage volume of 311.5 kl.



- The water used at the wash bays drained via grid inlets at the various locations and is reticulated via 300 mm dia. HD uPVC Class 34 pipes to Prefabricated traps viz. 2 no. 'Calcamite' 3 KL Sand, Grease and Oil Traps (or similar approved) at the Car Wash Bay and 2 no. 'Calcamite' 3 KL Sand, Grease and Oil Traps (or similar approved) at the Truck Wash Bay.



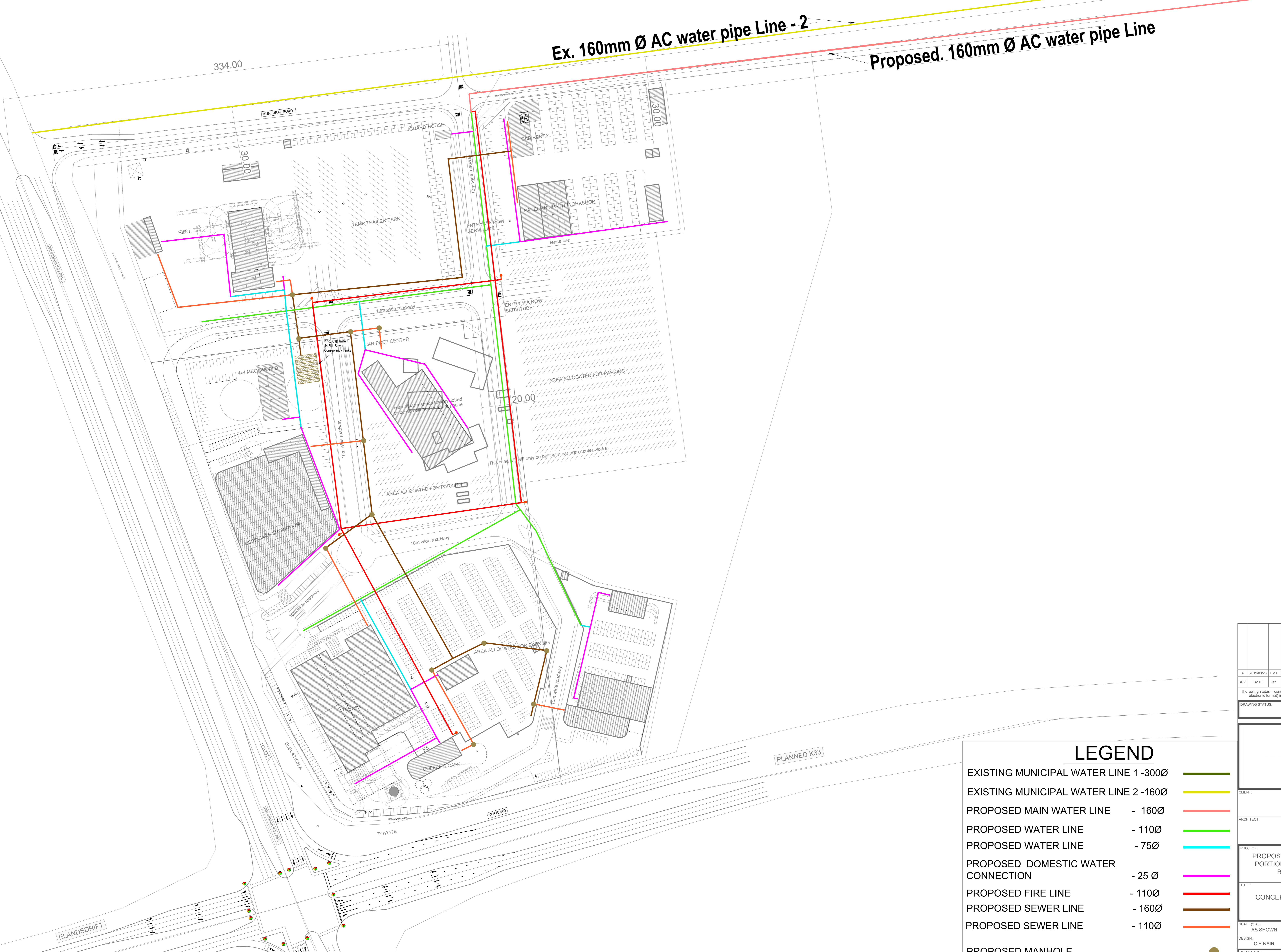
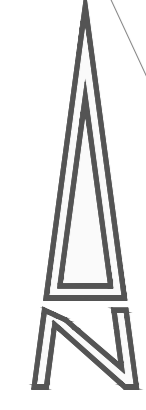
## 10 References

1. Design Manual for Small Sewage Treatment Works, WRC Report No. TT 389/09 (WRC Project No. K5/1660), April 2009
2. Guideline Document: Package Plants For The Treatment Of Domestic Wastewater, Report to the Department of Water Affairs, December 2009
3. Revision Of General Authorisations In Terms Of Section 39 Of The National Water Act, 1998 (Act No. 36 Of 1998)
4. Johannesburg Water : Guidelines And Standards For The Design And Maintenance Of Water And Sanitation Services, July 2016



## Appendix A

- Drawing C339-WSEW-LO-01-Water and Sewer Layout Plan



Ex. 160mm Ø AC water pipe Line - 2

Proposed. 160mm Ø AC water pipe Line

Ex. 300mm Ø AC water pipe Line - 1

### LEGEND

- EXISTING MUNICIPAL WATER LINE 1 -300Ø —
- EXISTING MUNICIPAL WATER LINE 2 -160Ø —
- PROPOSED MAIN WATER LINE - 160Ø —
- PROPOSED WATER LINE - 110Ø —
- PROPOSED WATER LINE - 75Ø —
- PROPOSED DOMESTIC WATER CONNECTION - 25 Ø —
- PROPOSED FIRE LINE - 110Ø —
- PROPOSED SEWER LINE - 160Ø —
- PROPOSED SEWER LINE - 110Ø —
- PROPOSED MANHOLE ●
- PROPOSED FIRE HYDRANT ●

A	2019/03/25	L.V.U	FOR INFORMATION	C.E.N	-
REV	DATE	BY	DESCRIPTION	CHK	APP
If drawing status = construction, a signed copy of this drawing (either in hardcopy or electronic format) is available at the office of origin and at the office of issue.					
DRAWING STATUS: <b>FOR INFORMATION</b>					
CLIENT:					
ARCHITECT:					
PROJECT: PROPOSED MOTOR DEALERSHIP ON PORTION 59 AND 168 OF THE FARM BULTFOONTEIN 533-JQ					
TITLE: CONCEPTUAL WATER AND SEWER LAYOUT PLAN					
SCALE @ AS SHOWN	CHECKED: C.E. NAIR	APPROVED:			
DESIGN: C.E. NAIR	DRAWN: L.V. UBISI / L.NAIR	DATE: 2019/03/25			
PROJECT No: C339-011118	DRAWING No: C339-WSWE-LO-01	REV: A			
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## Appendix B

- Johannesburg Municipality Water and Sewer GIS information (Existing network planning)



### Pipes

Topology

Link Type	PIPE
Link Code	763
From Node Code	2880
To Node Code	766

Hydraulic

Diameter (mm)	160
Length (m)	780.45
Friction Coefficient	115
Minor Loss Coefficient	0
Pipe Status	OPEN

Physical

Material	AC
Pressure Rating (kPa)	0
Nominal Diameter (mm)	160
Inside Diameter (mm)	160
Year	1982

Descriptive

System Type	RET
System	COSMO CITY RES - LANSERIA PRV
Region	RANDBURG DEPOT
Network	RANDBURG

Results

Balanced Status	OPEN
Flow (L/s)	-3.09

Legend Properties MP Browser



### Pipes

»

#### Topology

Link Type	PIPE
Link Code	2530
From Node Code	766
To Node Code	2530

#### Hydraulic

Diameter (mm)	300
Length (m)	576.40
Friction Coefficient	115
Minor Loss Coefficient	0
Pipe Status	OPEN

#### Physical

Material	AC
Pressure Rating (kPa)	0
Nominal Diameter (mm)	300
Inside Diameter (mm)	300
Year	1998

#### Descriptive

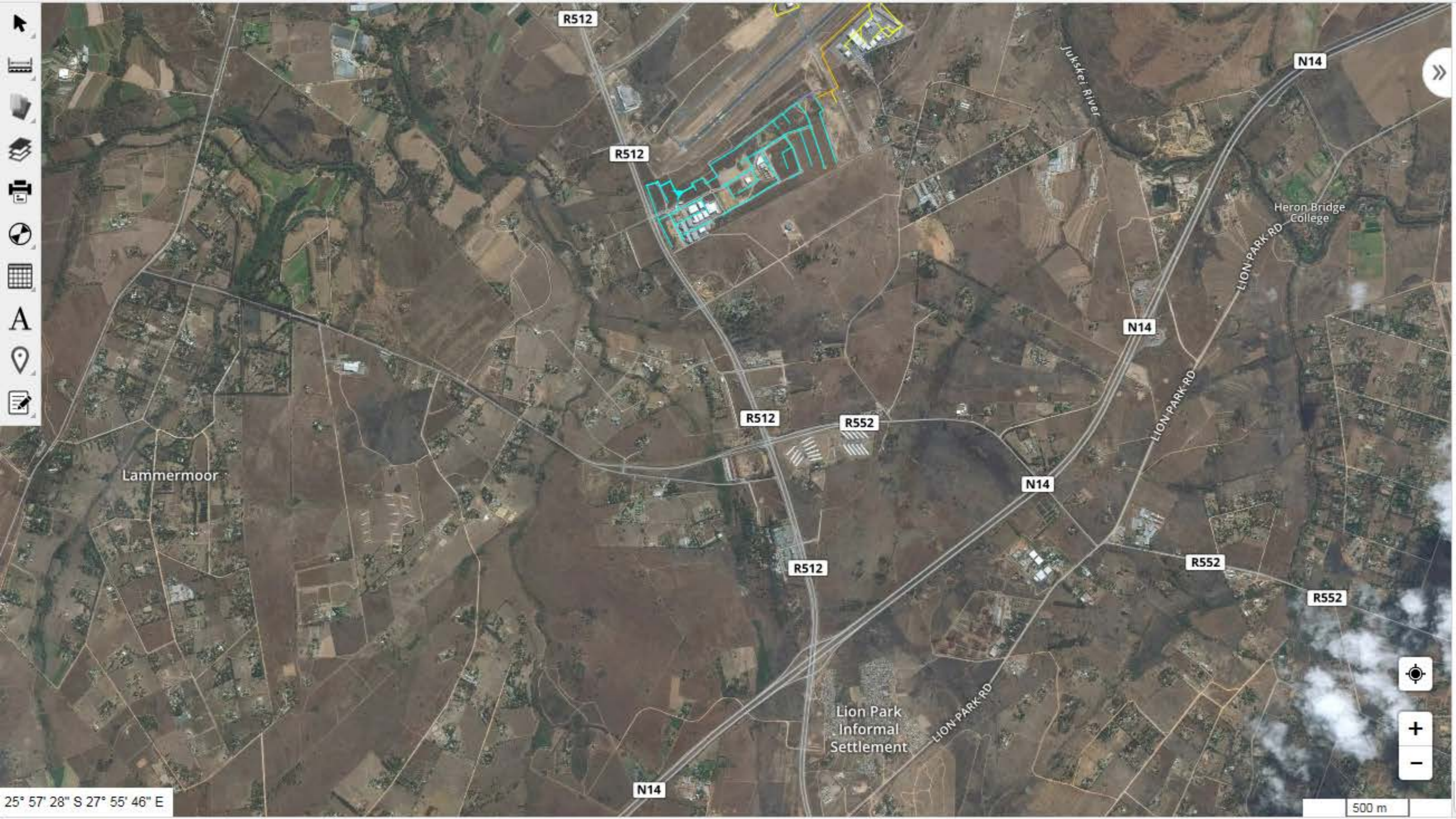
System Type	DBM
System	COSMO CITY RES - LANSERIA PRV
Region	RANDBURG DEPOT
Network	RANDBURG

#### Results

Balanced Status	OPEN
Flow (L/s)	-24.66

Legend Properties MP Browser





**Gravity Pipes - System Type**

- No data
- Bulk
- Collector
- Reticulation
- Bulk - External
- Collector - Private
- Reticulation - Private

**Gravity Pipes - Types**

- B** Bridge
- C** Culvert
- E** Encased
- S** Siphon
- SD** Sted
- T** Tunnel

**Rising Mains - System Type**

- No data
- Bulk
- Collector
- Reticulation
- Bulk - External
- Collector - Private
- Reticulation - Private

**Structures**

- Structures - Types**
- Conservancy Tank

Legend Properties MP Browser



- Johannesburg Municipality Water and Sewer GIS Information (Future network planning)

