

# MATJHABENG LOCAL MUNICIPALITY



## EXTENSION OF NETWORK, HOUSE CONNECTIONS AND METERS FOR 180 STANDS IN THABONG EXTENSION 20 (HANI PARK)

### REVISED TECHNICAL REPORT

FEBRUARY 2019

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## TECHNICAL REPORT APPROVAL SHEET

<b>Approval:</b>	<b>Executive Director:</b> _____	<i>Date</i>
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<b>Approval:</b>	<b>Municipal Manager:</b> _____	<i>Date</i>
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<b>Submitted for Approval by:</b>	<b>Project Manager :</b> _____	<i>Date</i>
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## 1. INTRODUCTION

### 1.1. Project Background

Epitome Consulting Civil Engineers and Project Managers was appointed by the Matjhabeng Local Municipality for the implementation of a network extension, meters and house connections in Thabong Extension 20 (Hani Park) in Welkom. The proposed extension will provide water to 180 stands which currently don't have access to water. The stands consists of two educational, one institutional, one recreational and 176 residential stands. The scope of work involves, inter alia, the following activities:

- Business plan
- Technical report
- Conceptual design report
- Preliminary design report
- Detailed designs
- Documentation and Procurement stage
- Construction monitoring and contract administration
- WSDP and IDP issues

### 1.2. Project Locality

The project is located in Welkom and Thabong Township in the Matjhabeng Local Municipality. The locality map of the area is shown in Figure 1. The project site can be accessible through the R73 provincial route and off Jupiter street.

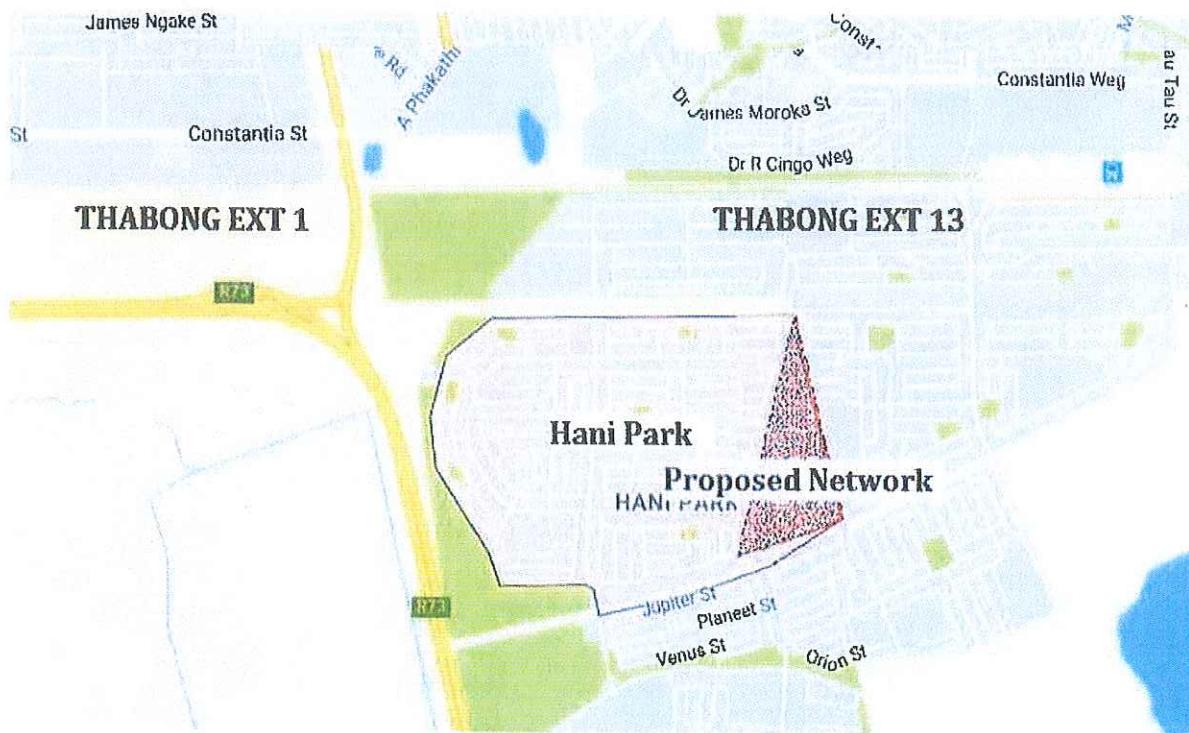


Figure 1: Locality Map

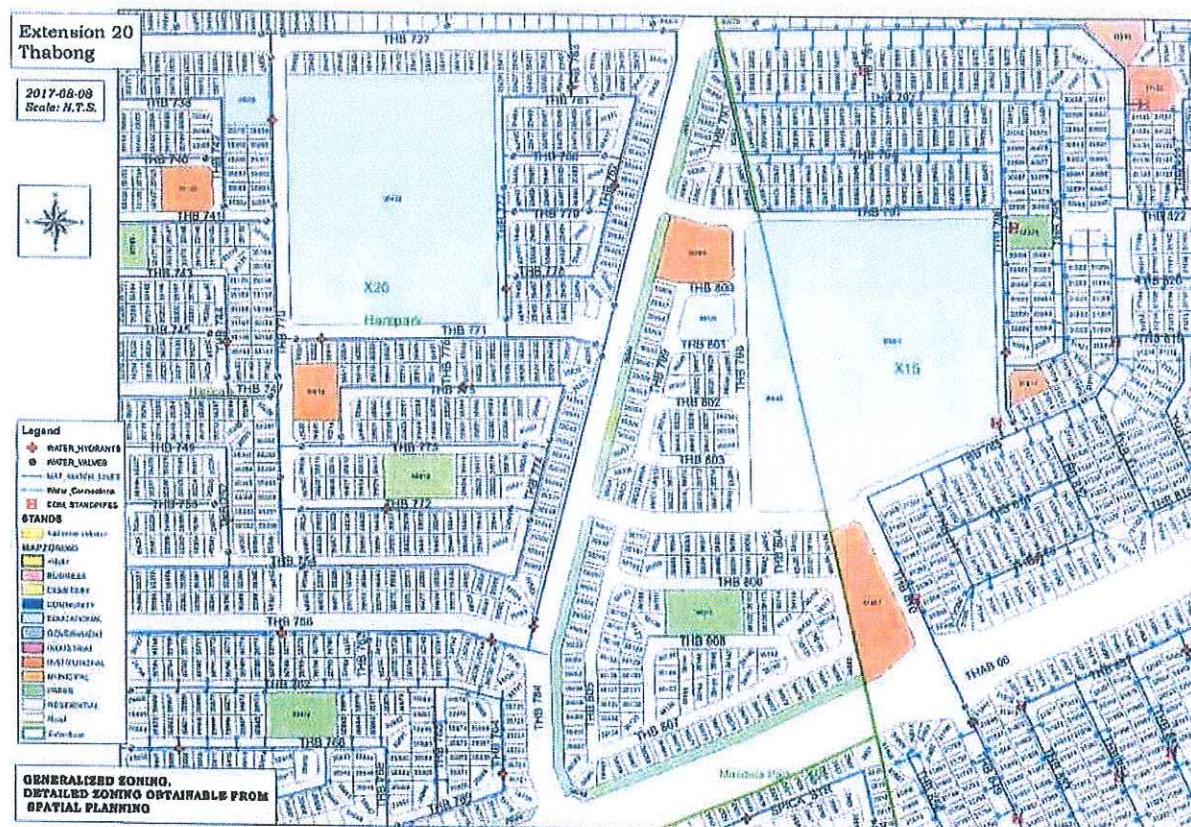


### **1.3. Hani Park Extension 20 Background**

Hani Park Extension 20 is part of a gold mining and manufacturing community and it is contained within the Hani Park area which prohibits further geographical growth of the area. The only envisaged growth for the project area is through an increased level of service from the current basic level to a much higher level service which will necessitate the higher water use.

#### 1.4. Existing Works

According to the Sedibeng Water Board, the Thabong area is feed by two (2) reservoirs referred to as the Old and New High Level Reservoir located in Riebeeckstad. Hani Park forms part of the Thabong area and our specific area Hani Park Extension 20 falls within Hani Park. The surrounding Hani Park area has an existing network. However, the targeted area as indicated in Figure 1, has no water infrastructure except for the end cap intended for future supply to the unserviced area.



**Figure 2: Existing Works**

The adequacy of the supply points will be confirmed during the detailed design and analysis of the existing network. The proposed network will supply water to the area enclosed by the shaded area indicated in Figure 1 and illustrated in Figure 2, above.

### **1.5. Proposed Works**

**Figure 3** shows the proposed network for the 180 stands, the supply point for the is also indicated on the figure. The proposed network was designed to account for future



economic growth. As the area develops from a low income area to a middle income area the network will accommodate the rising demand.

The project emanates from planning based on the Integrated Development Plan (IDP) from the municipality. The project is in line with the municipality's target of achieving 100% access to potable water. This project is complete in itself and there will be no additional phases of this project.

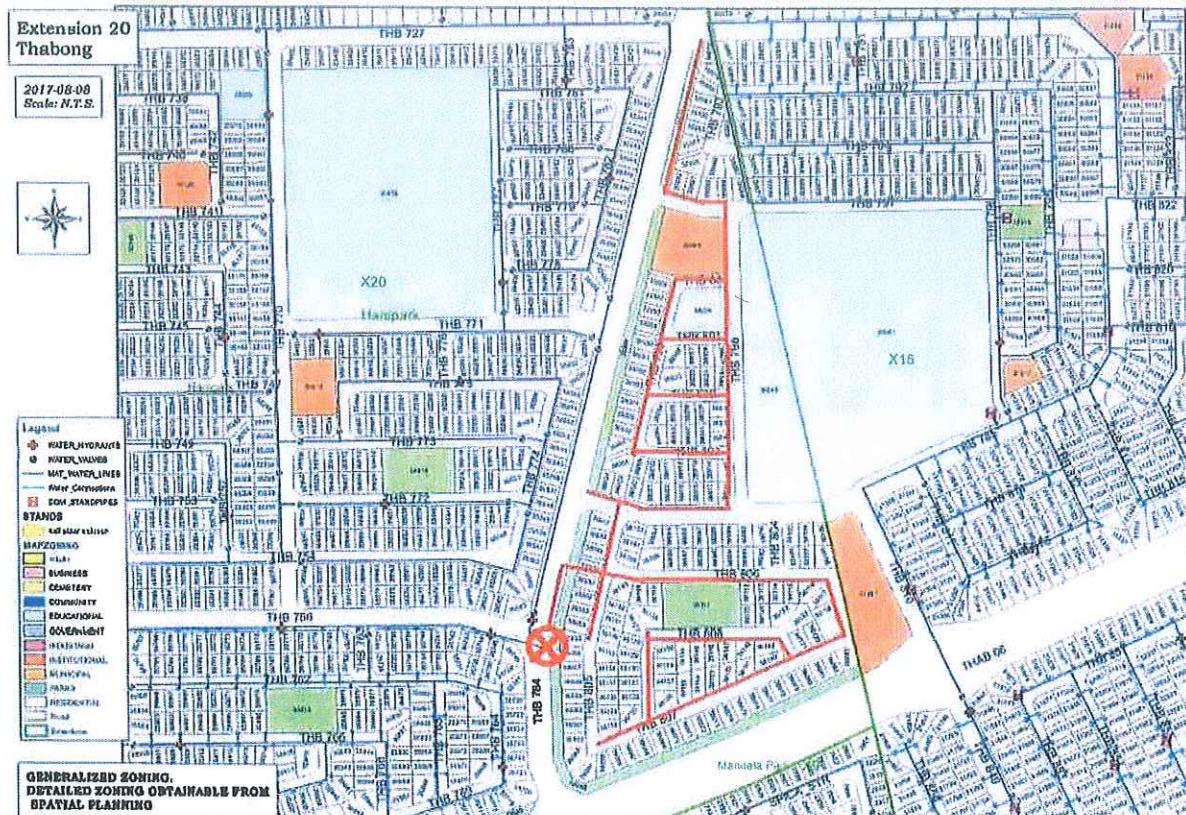


Figure 3: Proposed Water Network and Existing Connection Point

## 2. PRELIMINARY INVESTIGATIONS

### 2.1. Water Sources

A desktop study was conducted and it was found that Sedibeng Water is the water service provider and supplies mainly the Goldfields region and the mines with water from the Vaal River, Bulkfontein near Bothaville and to a lesser extent from the Sand River. Main reservoirs are east of Allanridge, in Welkom, north and south of Virginia. Pump stations are east of Allanridge and at Virginia where purification plant exist.

According to the Sedibeng Water Board, the Thabong area is feed by two (2) reservoirs referred to as the Old and New High Level Reservoir located in Riebeeckstad. The capacity of the resevoirs are 90ML and 120ML respectively, the reservoirs also feed Welkom, Wesselsbron, Ventersburg and at times Virginia when the Virginia treatment plant is not operational.



## 2.2. Topographical Data

Topographical data for the area was extracted and converted using softwares such as Google Earth, GPS Visualiser and TCX Converter. The methods used to get the topography of the area are accurate to 1m and this is fairly accurate for the preliminary stages of design. Table 1 shows the summarized version of the extracted data that shows the altitude relative to longitude and latitude. The complete table can be found in Appendix A.

**Table 1: Elevation Profile**

Latitude	Longitude	Altitude
-27,987862	26,820501	1361,712
-27,98683	26,82111	1362,074
-27,986851	26,821151	1361,963
-27,986966	26,821637	1361,045
<b>-27,986969</b>	<b>26,82169</b>	<b>1361,056</b>
-27,987001	26,821751	1361,204
-27,985246	26,822642	1364,977
<b>-27,985068</b>	<b>26,822554</b>	<b>1364,993</b>
-27,984989	26,822305	1364,495
-27,984631	26,821991	1363,091
Maximum Elevation		1364,993
Minimum Elevation		1361,045

The altitude for the supply point is 1364.00m above sea level and the highest point in the proposed network is 1364.9m. The topography of the area appears to be relatively flat considering the difference between the altitude of the highest and lowest point. This will help to meet the minimum pressure requirements of the proposed extension.

Please refer to Appendix A: Elevation Profile

## 3. PROJECT SCOPE OF WORKS

Based on the appointment letter, the scope of work for the professional services will entail the following activities:

- Business plan
- Technical report
- Conceptual design report
- Preliminary design report
- Detailed designs
- Documentation and Procurement stage
- Construction monitoring and contract administration

The construction scope of work will consist, inter alia, of the construction of the following network components:

- approximately 2.5 km of pipes (approximately 90mm diameter uPVC pipes – class t be confirmed during detailed design),



- Installation of 180 consumer meters
- 120 saddle clamps,
- Other network fittings (bends, tees, reducers, etc.)
- 6 fire hydrants and
- 5 isolating valves

A detailed breakdown of the proposed high level bill of quantities is appended in **Appendix B: Draft Bill of Quantities.**

### **3.1. Water Sources**

Matjhabeng Local Municipality is the Water Service Provider (WSP) and with Sedibeng Water as the Water Service Authority (WSA). All water requirements for the area are sourced from the Sedibeng bulk pipeline network. Based on the above, there is adequate water supply for the proposed development. In addition, the development is an extension of the existing network with overall planning having been conducted in the previous phases. The proposed development will have two connection points, that will be connected to the surrounding neighbouring areas existing water network in Hani Park Extension 20 & 15.

### **3.2. Distribution Network**

The distribution network is as indicated on **Figure 2** and comprises of the following:

- 180 metered connections
- 3.7 km pipeline of approximately 90mm diameter uPVC pipeline
- Apperturant water network components

Since this area has no existing network, there are currently no water losses in the area.

### **3.3. Population**

Various studies including the Community Survey and the Census provide the overall figures and do not give population figures for the smaller section such as the one for this project. As a result, the only reliable method that could be used was to determine the number of households and multiply it by the occupancy rate. The project area comprises of 180 stands and the Matjhabeng Local Municipality has an occupancy rate of 4 individuals per household. This gives a population of 720.

### **3.4. Water Consumption**

As mentioned previously, the amount of space on Ext 20 is limited to the area and cannot accommodate any population growth. It will however accommodate an increase in the level of service and an increase in water consumption. The above is as indicated in **Table 2: Water Consumption Calculation**, below.



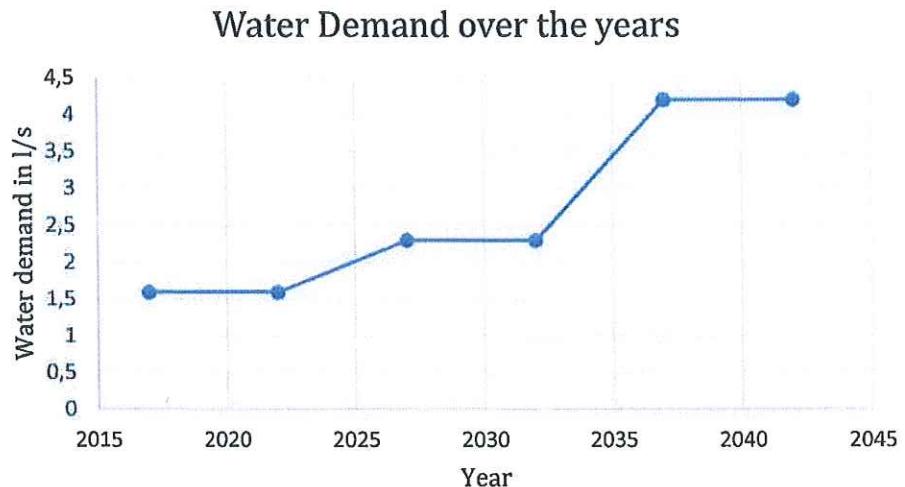
**Table 2: Water Consumption Calculation**

Community	House-holds	Popu-lation	Demand (kℓ)			Maximum Demand per day(kℓ)	SDD (l/s)	30% for losses	SDD + losses (l/s)	Comments
			Normal (l/c/d)	Schools	Total Calculated					
Current Demand (Low Income)	180	720	100	0,252	72	72,252	1,3	30%	1,6	Yard connection with flushing toilet
Mid term (Middle income)	180	720	130	6,3	93,6	99,9	1,7	30%	2,3	House connection with moderate to high development
Future Demand (High income)	180	720	250	6,3	180	186,3	3,2	30%	4,2	House connection with high development

Based on the above approach, the consumption will grow mainly as a result of the increase in the level of service and not as a result of the population growth since the area is confined.

The area is mainly residential with the only non-residential dwelling being a pre-school. Based on the Red Book, the current consumption for the pre-school is 0.6kl/hectare if there are no grounds, however, an allowance was made to ensure that should the upgrading of the pre-school take place, it is catered for in the future scenarios.

Based on Table 2, the growth in demand on 5 year interval is as indicated in Figure 4, below.



**Figure 4: Water demand 25 years**

Based on the above graph, the overall design is based on the overall design flow of 4.2l/s to be reached by year 2037.



#### 4. PROPOSED PROGRAM

**Table 3: Summarized Execution Program**

Task Name	Duration	Start	Finish
Water Reticulation Project	164 days	Mon 8/28/17	Thu 4/12/18
Business Plan (MIG 1)	5 days	Mon 8/28/17	Fri 9/1/17
Technical Report	5 days	Mon 8/28/17	Fri 9/1/17
Conceptual Design Report	10 days	Fri 9/1/17	Thu 9/14/17
Preliminary Design Report	10 days	Fri 9/15/17	Thu 9/28/17
Detailed Designs	10 days	Fri 9/29/17	Thu 10/12/17
Tender Documents	5 days	Fri 10/13/17	Thu 10/19/17
Tendering	12 days	Fri 10/20/17	Mon 11/6/17
Construction	169 days	Tue 06/11/18	Fri 28/06/19

**Table 2** above shows the summarized execution program for the project. A more detailed program is attached on Appendix C. Based on the above the program can be summarized as follows:

- Design Start Date: 15 August 2017
- Construction Start Date: 06 November 2018
- Duration: 8 months
- Completion Date: 28 June 2019

The accomplishment of major milestones of the project also depend on the speed with which the Matjhabeng Municipality's approvals are received. Construction is set to begin in November 2018 and the project will be completed on 28 June 2019.

#### 5. COST ESTIMATE

##### 5.1. Budget maintenance Application

The additional funding is needed based on the following reasons:

- With the increasing price of materials, the estimates needed to be revised to suite the current rate.
- The previous estimates were low and it will not be viable to finish the project with the budget.

The previous capital costs of the project are as indicated in **Table 4: Cost Estimate**, below.

**Table 4: Previous Cost Estimate**

Item	Unit	Qty	Rate	Cost
<b>1. SUPPLY AND LAY PIPES</b>				
<b>1.1 UPVC pipe</b>				
1.1.1 160mm	m	200	R 750.00	R 150,000.00
1.1.2 90mm	m	1500	R 450.00	R 675,000.00



1.1.3 75mm	m	163	R 380.00	R 61,940.00
1.1.4 50mm	m	117	R 270.00	R 31,590.00
1.1.5 25mm	m	50	R 130.00	R 6,500.00
<b>2. PIPE FITTINGS</b>				
<b>2.1 Gate Valve</b>				
2.1.1 90mm	No	4	R 1,000.00	R 4,000.00
2.1.2 90mm Fire hydrant	No	5	R 7,500.00	R 37,500.00
<b>2.2 Concentric Flanged Reducer</b>				
2.2.1 50 x 90mm	No	120	R 300.00	R 36,000.00
2.2.2 75 x 90mm	No	4	R 350.00	R 1,400.00
2.2.3 90 x 160mm	No	4	R 605.00	R 2,420.00
2.2.4 25 x 50mm	No	120	R 75.00	R 9,000.00
<b>2.3 3 or 4 Segment 90° Bend</b>				
2.3.1 90mm	No	15	R 315.00	R 4,725.00
<b>2.4 Equal Tee's</b>				
2.4.1 90mm	No	11	R 550.00	R 6,050.00
2.4.1 75mm	No	10	R 350.00	R 3,500.00
2.4.2 25mm	No	100	R 95.00	R 9,500.00
<b>2.5 Unequal Tee's</b>				
2.7.1 90mm x 160mm	No	4	R 750.00	R 3,000.00
2.7.2 75mm x 90mm	No	10	R 505.00	R 5,050.00
2.7.3 50mm x 90mm	No	100	R 455.00	R 45,500.00
2.7.4 25mm x 50mm	No	100	R 250.00	R 25,000.00
'				
<b>2.6 Water Meters</b>				
2.8.1 25mm	No	180	R 2,500.00	R 450,000.00
<b>3. Sub-Total</b>				<b>R 1,567,675.00</b>
<b>4 Site Establishment (@ 15%)</b>	sum	1	R 235,151.25	R 235,151.25
<b>5. Construction Costs</b>				<b>R 1,802,826.25</b>
<b>6. Contingencies</b>		<b>10%</b>		<b>R 180,282.63</b>
<b>7. Total Construction Costs</b>				<b>R 1,983,108.88</b>
<b>8. Professional fees</b>		<b>15%</b>		<b>R 297,466.33</b>



<b>9. Total Project Cost (Excl. VAT)</b>				R 2,280,575.21
<b>10. VAT</b>		14%		R 319,280.53
<b>11. Total Project Costs</b>				R 2,599,855.74

The revised capital costs of the project are as indicated in **Table 5: Cost Estimate**, below.

**Table 5: Revised Cost Estimate**

Thabong Hani Park Ext 20 Project – Revised Cost Estimation:		
ITEM	DESCRIPTION	COST (R)
3	Main supply pipeline (35 l/s)	
3.1	1 253 m x 32 mm dia	R810,572.35
3.2	121 m x 63 mm dia	R68,186.10
3.3	207 m x 75 mm dia	R133,475.29
3.4	343 m x 90 mm dia	R225,770.48
3.5	1143 m x 110 mm dia	R812,897.30
3.6	638 m x 160 mm dia	R754,949.18
3.7	Domestic water meters	R108,000.00
	Subtotal	<u>R2,913,850.69</u>
	10% contingencies	R291,385.07
	Professional fees and supervision	R480,785.36
	Subtotal	<u>R772,170.43</u>
	Total estimated cost	R3,686,021.13
	VAT	R516,042.96
	Total cost of scheme	<u>R4,202,064.08</u>

## 6. SMME DEVELOPMENT AND LABOUR INTENSIVE CONSTRUCTION APPROACH

One of the basic requirements for all development projects and in the current socio-economic situation is that a percentage of the construction budget should be expended on local SMME and labour-intensive construction. This item is hugely dependent on the availability of the local subcontractors that are properly registered and have the capacity to perform the identified portions of the project. In addition, the suitability of the project to the implementation of such a requirement plays a crucial role.

## 7. REFERENCES

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- CSIR. (2001). *Guidelines to Human Settlement, Planning and Design Vol 2*. Johannesburg: Department of Housing.
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## 8. APPENDICES



## 8.1. Appendix A: Appointment Letter

### MATJHABENG

**Municipality  
Umasipala**  
P O Box 708  
Welkom, 9460  
South Africa



**Mmasepala  
Munisipaliteit**

### OFFICE OF THE CHIEF FINANCIAL OFFICER

09 JUNE 2017

ATTENTION: MR. CLEMENT MOKOENENE

**Messrs. EPITOME CONSULTING**  
SUITE NO. 4  
44 Van Riebeck Road  
SENEKAL  
9485

Tel: 083 404 2135  
Fax: (086) 505 0993

Dear Sir/Madam

**APPOINTMENT AS CONSULTING ENGINEERS FOR THE THABONG X20 (HANI PARK):  
EXTENSION OF WATER NETWORK, HOUSE CONNECTIONS AND METERS (180  
STANDS)**

1. It is with great pleasure to inform you that you have been appointed as Consulting Engineers for Thabong X20 (Hani Park): Extension of water network, house connections and meters (180 stands)
2. Your appointment is subject to the following:
  - 2.1 Registration of the project, approval and availability of the Municipal Infrastructure Grant funding as well as confirmation thereof, and
  - 2.2 Conclusion of a Service Level Agreement between yourself and the Municipality within fourteen (14) working days.



- 3.4 Monitoring and supervision of the project with the provision of a full time Resident Engineer at construction stage,
  - 3.5 Preparation of monthly and Ad-Hoc reports,
  - 3.6 Preparation of close out reports and As-Built drawings,
  - 3.7 Compilation of maintenance plan
4. Your total professional fees will be calculated as per the Government Gazette no. 39480: Guidelines for services and processes for estimating fees for persons registered in terms of the Engineering Profession Act (46/ 2000) and must be approved by the Municipal Manager,
  5. You will be required to accept this offer of appointment in writing within seven (7) working days from the date of receipt.
  6. Further on, you are requested to furnish us with the following documentation:
    - 6.1 Proof of your Indemnity Insurance,
    - 6.2 A structure of your key personnel for the project, and
    - 6.3 A detailed programme of Works.
  7. Please do not hesitate to contact us should you require further information.
  8. We trust that you will find the above in order.

Yours faithfully

MR. CHAMBO TSOAELI  
ACPING MUNICIPAL MANAGER

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Appointment as Consulting Engineers for the Thabong X20 (Lilani Park): Extension of water network, house connections and meters (180 stands) – Eptemic Consulting



## 8.2. Appendix B: Elevation Profile

LATTITUDE	LONGITUDE	ALTITUDE
-27,989	26,8208	1361,23
-27,989	26,8205	1361,24
-27,989	26,8205	1361,24
-27,989	26,8206	1361,46
-27,989	26,8211	1361,34
-27,989	26,8212	1361,3
-27,989	26,8214	1361,46
-27,988	26,8212	1361,78
-27,988	26,8212	1361,78
-27,988	26,8209	1361,96
-27,988	26,8208	1361,95
-27,988	26,8205	1361,62
-27,988	26,8205	1361,64
-27,988	26,8205	1361,71
-27,988	26,8205	1361,7
-27,988	26,8208	1361,5
-27,988	26,8208	1361,47
-27,988	26,8209	1361,5
-27,988	26,8211	1361,61
-27,988	26,8214	1361,73
-27,988	26,8216	1361,9
-27,988	26,8219	1361,9
-27,988	26,8221	1362
-27,988	26,8223	1362,07
-27,988	26,8223	1362,26
-27,988	26,822	1361,89
-27,988	26,8216	1361,44
-27,988	26,8212	1361,29
-27,988	26,8211	1361,29
-27,988	26,8207	1361,39
-27,987	26,8205	1361,85
-27,987	26,8207	1361,9
-27,987	26,8207	1361,88
-27,987	26,8212	1361,28
-27,988	26,8217	1361,15
-27,988	26,8217	1361,22
-27,988	26,8223	1362,29
-27,988	26,8223	1362,37



-27,988	26,8227	1362,49
-27,988	26,823	1362,54
-27,988	26,8232	1362,84
-27,987	26,823	1363,01
-27,988	26,8229	1362,98
-27,988	26,8227	1362,97
-27,987	26,8221	1362,1
-27,987	26,8217	1361,06
-27,987	26,8213	1361,24
-27,987	26,821	1361,62
-27,987	26,8207	1362,15
-27,987	26,8206	1362,74
-27,987	26,8208	1362,93
-27,987	26,8211	1362,07
-27,987	26,8212	1361,96
-27,987	26,8216	1361,05
<b>-27,987</b>	<b>26,8217</b>	<b>1361,06</b>
-27,987	26,8218	1361,2
-27,987	26,8222	1362,3
-27,987	26,8226	1363,19
-27,987	26,8227	1363,28
-27,987	26,8227	1363,33
-27,987	26,823	1363,59
-27,987	26,8231	1363,7
-27,987	26,8231	1364,16
-27,987	26,8231	1364,24
-27,987	26,823	1364,22
-27,987	26,8229	1363,97
-27,987	26,8226	1363,22
-27,987	26,8225	1363,01
-27,987	26,8222	1362,3
-27,987	26,8219	1361,65
-27,987	26,8215	1361,3
-27,987	26,8212	1362,25
-27,987	26,8209	1362,83
-27,986	26,8208	1362,58
-27,986	26,8209	1362,52
-27,986	26,8212	1362,28
-27,986	26,8212	1362,25
-27,986	26,8216	1361,75
-27,986	26,8216	1361,64



-27,986	26,822	1362,28
-27,986	26,8221	1362,35
-27,986	26,8221	1362,42
-27,987	26,8225	1363,06
-27,987	26,8229	1364,44
-27,987	26,823	1364,88
-27,986	26,8229	1364,89
-27,986	26,8226	1363,84
-27,986	26,8226	1363,72
-27,986	26,8223	1363,01
-27,986	26,822	1362,54
-27,986	26,8217	1362,13
-27,986	26,8214	1362,23
-27,986	26,8211	1362,33
-27,986	26,8211	1362,34
-27,986	26,8209	1362,17
-27,986	26,8209	1362,19
-27,986	26,8211	1362,34
-27,986	26,8211	1362,39
-27,986	26,8214	1362,55
-27,986	26,8219	1362,92
-27,986	26,822	1363,06
-27,986	26,8222	1363,36
-27,986	26,8223	1363,45
-27,986	26,8223	1363,47
-27,986	26,8226	1363,94
-27,986	26,8226	1364
-27,986	26,8228	1364,81
-27,986	26,8228	1364,93
-27,986	26,8228	1364,89
-27,986	26,8224	1363,92
-27,986	26,8222	1363,62
-27,986	26,8218	1363,24
-27,986	26,8216	1362,91
-27,986	26,8215	1362,83
-27,986	26,8212	1362,6
-27,985	26,8211	1362,63
-27,985	26,8212	1362,8
-27,985	26,8213	1362,85
-27,985	26,8214	1362,87
-27,985	26,8216	1362,98



-27,985	26,8217	1362,99
-27,986	26,822	1363,55
-27,986	26,8223	1363,91
-27,986	26,8225	1364,34
-27,986	26,8227	1364,71
-27,985	26,8226	1364,71
-27,985	26,8224	1364,32
-27,985	26,8224	1364,26
-27,985	26,8221	1363,79
-27,985	26,8219	1363,41
-27,985	26,8216	1362,98
-27,985	26,8214	1362,94
-27,985	26,8212	1362,94
-27,985	26,8213	1363
-27,985	26,8214	1363
-27,985	26,8215	1363
-27,985	26,8216	1363
-27,985	26,8219	1363,45
-27,985	26,8222	1364,05
-27,985	26,8224	1364,53
-27,985	26,8224	1364,56
-27,985	26,8226	1364,9
-27,985	26,8226	1364,98
-27,985	26,8226	1364,99
-27,985	26,8223	1364,5
-27,985	26,822	1363,69
-27,985	26,8218	1363,2
-27,985	26,8216	1363
-27,985	26,8214	1363
-27,984	26,8215	1363
-27,984	26,8215	1363
-27,985	26,8217	1362,99
-27,985	26,822	1363,09
-27,985	26,822	1363,12
-27,985	26,8222	1363,72
-27,985	26,8225	1364,14
-27,985	26,8225	1364,14
-27,985	26,8224	1362,99
-27,985	26,8222	1362,77
-27,984	26,8219	1362,84
-27,984	26,8216	1363



-27,984	26,8215	1363
-27,984	26,8216	1363,18
-27,984	26,8216	1363,19
-27,984	26,8218	1362,89
-27,984	26,822	1362,27
-27,984	26,8221	1362,11
-27,984	26,8221	1362,03
-27,984	26,8223	1361,85
-27,984	26,8224	1361,72
-27,984	26,8224	1361,9
-27,984	26,8223	1362,68
-27,984	26,822	1363,14
-27,984	26,8218	1363,45
-27,984	26,8216	1363,58
-27,984	26,8217	1363,9
-27,984	26,8219	1364,04
-27,984	26,8219	1364,01
-27,984	26,8223	1363,74
-27,983	26,8223	1364,95
-27,983	26,822	1364,86
-27,983	26,8218	1364,37
-27,983	26,8218	1364,27
-27,983	26,8221	1364,57
-27,983	26,8219	1364,28
-27,983	26,8219	1364,16
-27,983	26,8219	1364,16
-27,982	26,8221	1364
Max		1364,99
Min		1361,05



### 8.3. Appendix C: Project Program

Task Name	Duration	Start	Finish
<b>THABONG X20: EXTENSION OF WATER NETWORK, HOUSE CONNECTIONS AND WATER METERS</b>	489 days	Mon 14 08 17	Thu 27 06 19
<b>Business Plan (MIG 1)</b>	12 days	Thu 17 08 17	Fri 01 09 17
Request Format from MLM	2 days	Mon 14 08 17	Tue 15 08 17
Compile Business Plan	5 days	Wed 16 08 17	Tue 22 08 17
Submit to MLM	3 days	Wed 23 08 17	Fri 25 08 17
Approval of Business Plan	2 days	Mon 28 08 17	Tue 29 08 17
<b>Technical Report</b>	12 days	Thu 17 08 17	Fri 01 09 17
Request Format from MLM or DWS	2 days	Mon 14 08 17	Tue 15 08 17
Compile Technical Report	5 days	Wed 16 08 17	Tue 22 08 17
Submit to MLM	3 days	Wed 23 08 17	Fri 25 08 17
Approval of Technical Report	2 days	Mon 28 08 17	Tue 29 08 17
<b>Conceptual Design Report</b>	11 days	Wed 30 08 17	Wed 13 09 17
Scope of Work confirmation	1 day	Wed 30 08 17	Wed 30 08 17
Conceptual Design	5 days	Thu 31 08 17	Wed 06 09 17
Conceptual Design Report	3 days	Thu 07 09 17	Mon 11 09 17
Approval/Comments on Conceptual Design Report	2 days	Tue 12 09 17	Wed 13 09 17
<b>Preliminary Design Report</b>	14 days	Thu 14 09 17	Tue 03 10 17
Preliminary Investigations	2 days	Thu 14 09 17	Fri 15 09 17
Design standards confirmation	2 days	Thu 14 09 17	Fri 15 09 17
Preliminary Designs	5 days	Thu 14 09 17	Wed 20 09 17
Way-leave investigations and applications	10 days	Thu 14 09 17	Wed 27 09 17
Report Writing	5 days	Thu 21 09 17	Wed 27 09 17
Submission of PDR	1 day	Thu 28 09 17	Thu 28 09 17
Approval of PDR	3 days	Fri 29 09 17	Tue 03 10 17
<b>Detailed Investigation and Design</b>	2 days	Fri 29 09 17	Mon 02 10 17



Detailed Designs	19 days	Fri 29 09 17	Wed 25 10 17
Design Standards	2 days	Tue 03 10 17	Wed 04 10 17
Detailed Design	5 days	Thu 05 10 17	Wed 11 10 17
Report Writing	3 days	Thu 12 10 17	Mon 16 10 17
Submission of PDR	1 day	Tue 17 10 17	Tue 17 10 17
Approval of PDR	3 days	Wed 18 10 17	Fri 20 10 17
Tender Documents	10 days	Mon 23 10 17	Fri 03 11 17
Specifications	5 days	Mon 23 10 17	Fri 27 10 17
Drawings	5 days	Mon 23 10 17	Fri 27 10 17
Bills of Quantities	5 days	Mon 23 10 17	Fri 27 10 17
Standard Tender Document Completion	5 days	Mon 23 10 17	Fri 27 10 17
Approval of Tender Documents	5 days	Mon 30 10 17	Fri 03 11 17
<b>Tendering</b>	<b>29 days</b>	<b>Mon 06 11 17</b>	<b>Thu 14 12 17</b>
Tender Advertisement	5 days	Mon 06 11 17	Fri 10 11 17
Tender Briefing Session	1 day	Mon 13 11 17	Mon 13 11 17
Tender Period	14 days	Mon 13 11 17	Thu 30 11 17
Tender Closure	1 day	Fri 01 12 17	Fri 01 12 17
Tender Adjudication	5 days	Mon 04 12 17	Fri 08 12 17
Preparation of Tender Adjudication Report	5 days	Fri 01 12 17	Thu 07 12 17
Approval Adjudication Report	5 days	Fri 08 12 17	Thu 14 12 17
<b>Construction</b>	<b>168 days</b>	<b>Tue 06 11 18</b>	<b>Thu 27 06 19</b>
Appointment of Contractor	10 days	Tue 06 11 18	Mon 19 11 18
Site Hand-over	1 day	Tue 20 11 18	Tue 20 11 18
Construction	7 mons	Wed 21 11 18	Tue 04 06 19
Site Hand-over by Contractor	1 day	Wed 05 06 19	Wed 05 06 19
Certificate of Completion	1 day	Wed 05 06 19	Wed 05 06 19
As-Built Drawings and Close-Out Report	16 days	Thu 06 06 19	Thu 27 06 19

