

Annexure I

Electrical Services Report

ELECTRICAL SERVICES REPORT

Proposed Development of the Farms De Kloof 2921 and 1/2165, District Bloemfontein, Free State Province

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1. Description of Proposed Works

1.1 Introduction

1.1.1 Proposed Development

Thabile Engineering has been appointed to investigate and report on the availability and requirements for an electrical connection and the requirements from the Local Electricity Supply Authority, Centlec, for the farms De Kloof 2921 and 1/2165.

1.1.2 Proposed Rezoning

Mixed Usage

1.1.3 Development Description

Refer to Annexures A and C for details wrt the development layout and land usage.

1.1.4 Location

The development is located west of the R700 (Kenneth Kaunda road) between Wild Olive and Somerton Estates. Refer to Annexure A for the locality plan.

1.1.5 Existing Land Use and Services

Currently the land identified for further development is undeveloped open land, used for farming purposes. There is a single farmstead on the land as depicted in Annexure A. The property does have an existing electrical connection to the farmstead.

Centlec has the following existing services on the land:

- a. Existing 132kV Bayswater Switching Station – Noordstad Distribution Centre overhead electrical line across the land next to the R700 as depicted in Annexure B attached to this report.
- b. The 132/11 kV Noordstad Distribution Centre located on the north eastern corner of the property.
- c. 3 x 11 kV Primary cables, installed in the 132 kV line servitude at a depth of 1 m.

1.2 Electrical Connection and Requirements

1.2.1 Expected Maximum Electrical Load

The calculated expected maximum electrical load for the new development will be 6132 kVA. Refer to Annexure C for the detail load calculation.

1.2.2 Existing Centlec Electrical Infrastructure

The 132/11 kV Noordstad Distribution Centre is located in the north eastern corner of the De Kloof development and is ideally placed to supply the development's required electrical load. Wild Olive Estate is located to the south of the De Kloof development.

Centlec has installed (in the 132 kV line servitude) 3 x 11 kV primary cables to the Wild Olive development. One of these primary cables is earmarked for the future primary substation planned to be provided in Olea drive.

Centlec has another primary substation available to the north of De Kloof on Somerton Estate. It is Centlec's policy to connect these primary substations via a so-called secondary cable which will feed all the required mini-substations.

1.2.3 New Electrical Connection

It is thus the intention that the Olea drive (future) primary substation and the Somerton primary substation be connected via a secondary 11 kV cable traversing the De Kloof development and picking up a load of 3.5 MVA.

To provide for the De Kloof load in excess of 3.5 MVA the developer will have to provide a (third) primary substation. Please refer to Annexure B for a view of the existing and proposed 11 kV networks.

1.2.4 Special Requirements

- a. The developer has to register the following servitudes for Centlec's Services
 - i. New Substation Building – 16m x 8m
 - ii. Various mini-substation servitudes on street walks (6.5 m x 2.5 m)
- b. The developer will be required to contribute towards the cost of extending and strengthening Centlec's electrical supply network on a pro-rata basis.
- c. The developer has to construct a 3 room substation according to Centlec's specifications and requirements.
- d. The developer has to provide his own electrical supply cables, transformers and distribution equipment feeding from the new Centlec connection points (on the development's boundaries) to the points where electricity is required inside the development.
- e. All electrical installations to be connected shall be certified to comply with SANS 10142.

1.2.5 Proposed Distribution System

The proposed electrical distribution system to be provided by the developer inside the new development will consist of the following:

- i. 11kV Underground cable ring through the development
- ii. 11kV/400/231 V miniature substations strategically placed to supply new stands/buildings
- iii. LV Metering and connection kiosks from where new buildings will be connected
- iv. Stands with a bulk load requirement in excess of 500 kVA will be provided with an 11 kV bulk supply point

2. Estimated Costs

Costs for a new bulk electrical connection from Centlec will be payable as a Network Contribution.

A new 3 room brick substation with transformer and LV distribution equipment has to be constructed according to Centlec's specifications.

The following estimated costs are based on a single application for a 6132 kVA electrical connection but, dependent on the development plan, the electrical connection can be implemented in phases resulting in the pro rata payment of the network contribution fees.

2.1 Network Contribution

Network contribution will be calculated for the capacity of the electrical connection:
Expected calculated Total ADMD load = 6132 kVA

No	Description	kVA	R/kVA	Total
1.	Primary Backbone Costs	6132	R 751.27	R 4,606,787.64
2.	Secondary Backbone Costs	6132	R 575.48	R 3,528,843.36
3.	Other Costs			R 78,000.00
				R 8,213,631.00
	VAT 14%			R 1,149,908.34
	Total Estimated Network Contribution			R 9,363,539.34

Table 1: Estimated Network Contribution

2.2 Account Deposit

No deposit.

2.3 Cost Escalations

The network contribution was calculated using the 2015/2016 Centlec tariffs which was valid until 30 June 2016. The tariffs were escalated by 10% for 1 July 2016 to 30 June 2017.

2.4 Construction of new 3 room substation

The expected cost for the new 3 room substation will be ± R 471 000.00 (VAT Included)

The following cables and equipment will be supplied by Centlec:

- The 11 kV switchgear
- Cables beyond the boundaries of the development to Somerton and Olea Primary Substations
- The 11 kV equipment to be installed in the proposed Primary Substation

2.5 132 kV Power Line Route

There was a request by the client to either move the existing 132 kV power line on the development's border to the land on the other side of the R700 or to replace it with an underground cable and decommission and remove the line completely.

Moving the line to the land on the other side of the road would require a detail investigation. Thabile Engineering is of the opinion that it is not technically feasible to remove the short piece of HV line and to replace it with an underground cable network. Centlec will however have the final say in the reply to this request.

3. Annexures

The following Appendixes are attached to and forms part of this document:

- Annexure A: Locality Plan
- Annexure B: Approximate Indication of Centlec Services
- Annexure C: Expected Maximum Load Calculation



J A Deacon (Pr. Eng.)
For Thabile Engineering

ANNEXURE A

Locality Plan



Figure1: Locality Plan

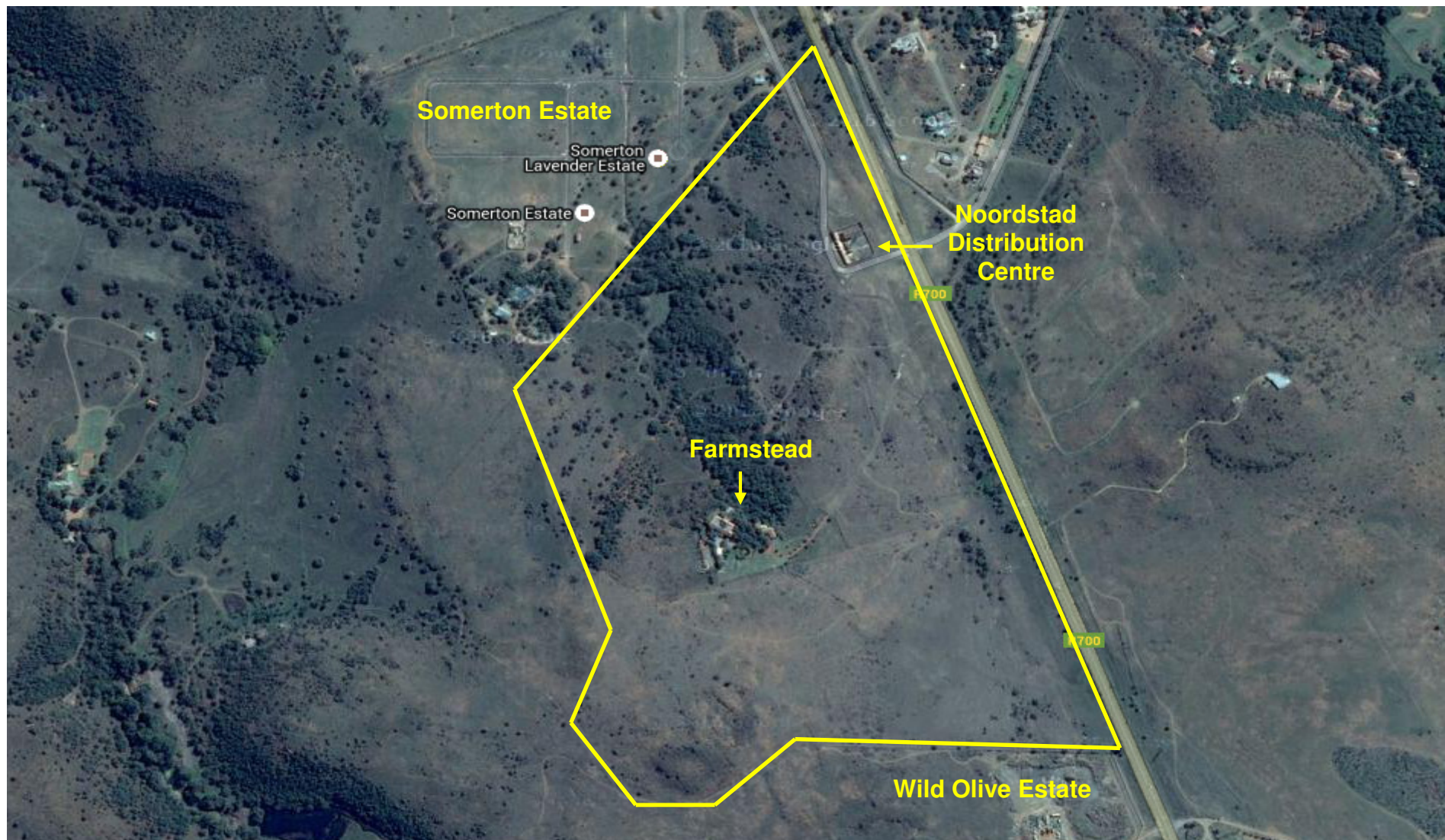


Figure: 2: Locality Plan showing the existing farmstead on the land

ANNEXURE B

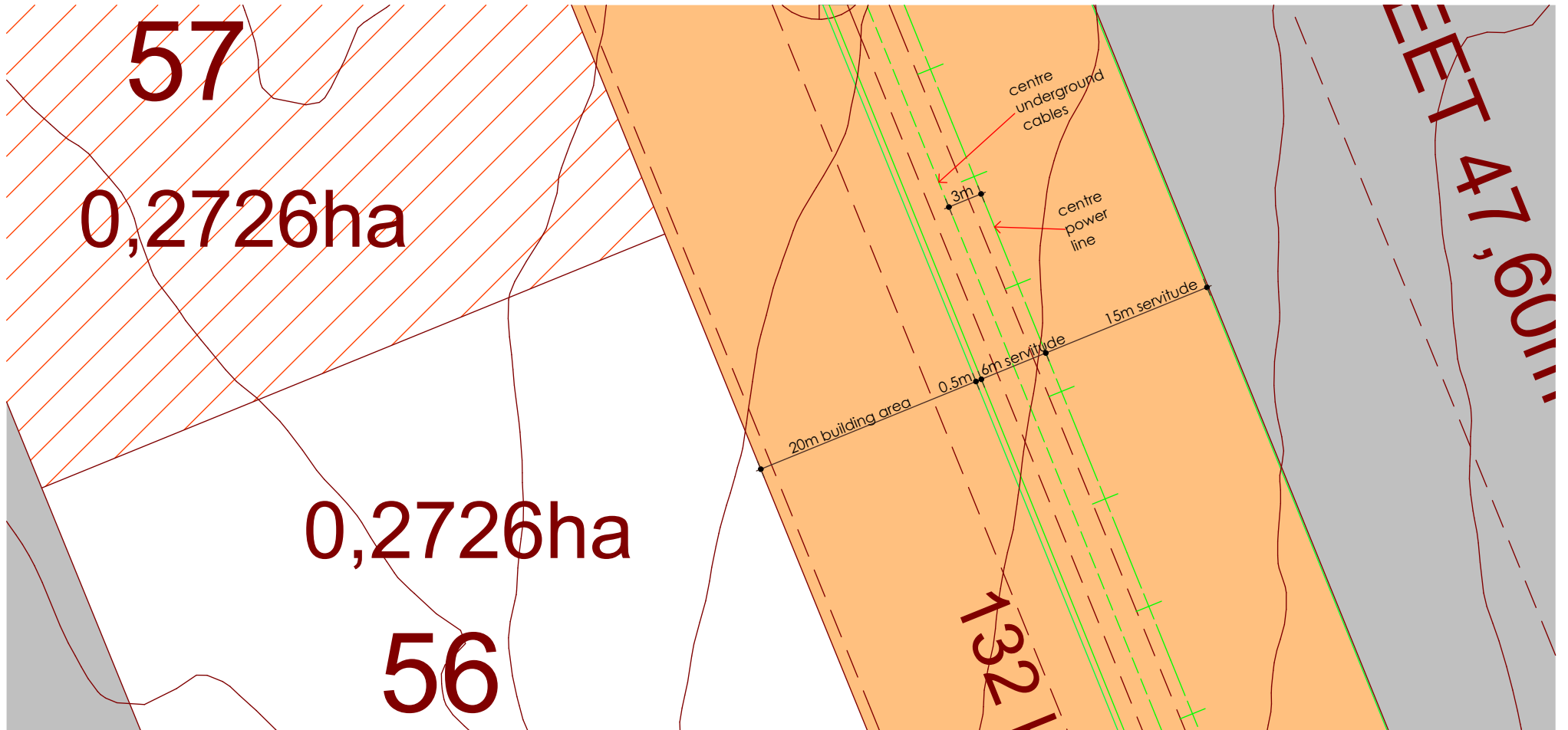
Approximate Indication of Centlec Services

ANNEXURE C

Expected Maximum Load Calculation

Load Analysis						
Item	Stand No.	Description	Number of Units	Total Units	ADMD (kVA)	Load (kVA)
1	1 thru to 39	Residential 1	39	39	4	156
2	41	Residential 2	80	80	3	240
3	42	Frail Care Unit	120 x Beds	-	-	240
4	43	Hospital	300 x Beds	-	-	1,000
5	Town Houses					
5.1	55 thru to 62	Town Houses	8 x 10	80	3	240
5.2	63		1 x 9	9	3	27
5.3	64		1 x 7	7	3	21
5.4	65 thru to 68		4 x 6	24	3	72
5.5	72		1 x 9	9	3	27
5.6	73 thru to 77		5 x 10	50	3	150
6	Flats					
6.1	45 thru to 47	Flats	3 x 135	405	2.5	1,013
6.2	48 thru to 50		3 x 120	360	2.5	900
6.3	50 and 69		2 x 150	300	2.5	750
6.4	78		1 x 135	135	2.5	338
6.5	79		1 x 150	150	2.5	375
7	Light Industrial					
7.1	53	Area (m ²)	11,115	0.6	40	267
7.2	54	Area (m ²)	9,475	0.6	40	227
7.3	82	Area (m ²)	3,759	0.6	40	90
8	Total ADMD Load (kVA)					6,132

Table 2: Load Analysis



POWER LINE AND CABLE POSITION
SCALE 1:500