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To:	Nkanivo Development Consultants	From:	Nico van Wyk
Tel No:	012 807 7445	Cell No:	082 600 8328
For Att:	Mr Samuel Chauke	Email	nicovw@burotech.co.za
Email:	info@nkanivo.co.za	Page:	1 of 10
Date:	03 May 2021	Ref:	PK24 / DSN

**RE: PROPOSED TOWNSHIP DEVELOPMENT – SITUATED ON PORTIONS 4, 5, R/12, 13, & 22 OF THE FARM GEMSBOKSPRUIT 229-JR
ELECTRICAL SERVICES – BASIC OUTLINE SERVICES REPORT – Version 1**

Dear Samuel,

Enclosed please find for your information and attention the basic outline services report for the electrical services as requested.

Update Notes

Version 1:

Original Issue – 03 May 2021 (Eskom inputs/comments pending)

Kindly contact us should any additional information be required.

Yours Faithfully

Nico van Wyk (Pr. Eng)

Cc: Nil

Enclosed: Report, Version 1

Members: NJS van Wyk Pr Eng B Sc (Ing) (Elek) MSAACE MSAIEE MIESSA
CK 92/05979/23



Registered Firm: CESA
Soli Deo Gloria



ELECTRICAL SERVICES

BASIC OUTLINE SERVICES REPORT

PROPOSED TOWNSHIP DEVELOPMENT GEMSBOKSPRUIT

**SITUATED ON PORTIONS 4, 5, R/12, 13 & 22 OF
THE FARM GEMSBOKSPRUIT 229-JR**



PREPARED BY:

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Tel: 012 807 7445
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DATE: 03 May 2021
Version 1

PROJECT: PK24/DSN

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PROPOSED TOWNSHIP DEVELOPMENT – GEMSBOKSPRUIT SITUATED ON PORTIONS 4, 5, R/12, 13 & 22 OF THE FARM GEMSBOKSPRUIT 229-JR ELECTRICAL SERVICES– BASIC OUTLINE SERVICES REPORT

Date: 03 May 2021
Version 1

1. Introduction

Nkanivo Development Consultants, the professional town planners for the proposed Gemsbokspruit situated on Portions 4, 5, R/12, 13 & 22 of the Farm Gemsbokspruit 229-JR, appointed Buro Tech Consulting Engineers on 09 April 2021 as the Specialist Electrical Engineers.

This report is based on information received from:

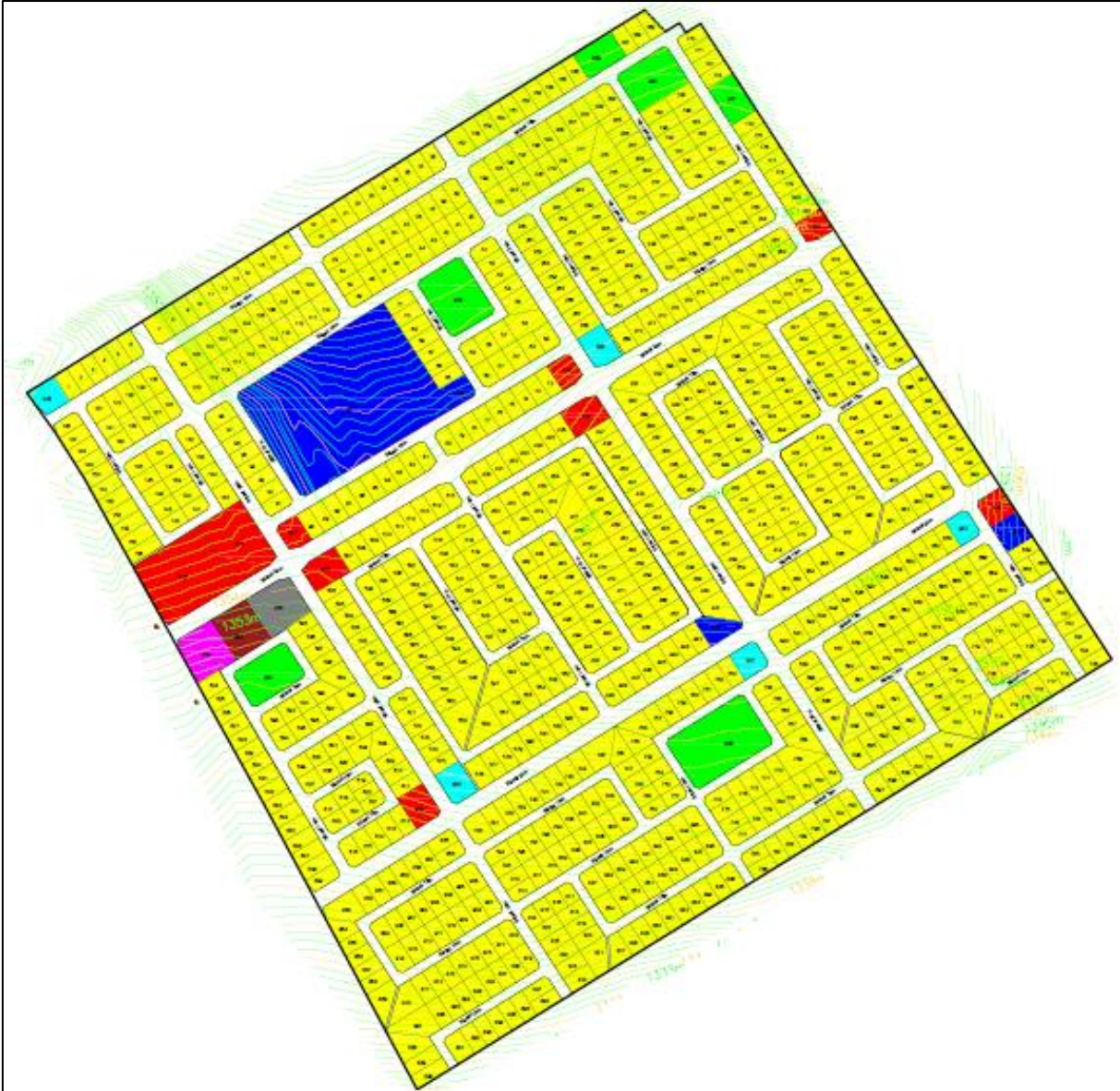
- Nkanivo Development Consultants on 09 April 2021, with updates on 15 & 26 April 2021.
- Site assessment on 26 April 2021

The locality map showing the proposed Gemsbokspruit and the Eskom Gemsbokspruit 132/22kV substation is as follows:



Image 1: Locality Map – Proposed Gemsbokspruit development

The proposed Township Gemsbokspruit layout as per Town planners (incl Land use table) is as follows:



ZONING	LAND USES	NO. OF ERF	AREA (HA)	AREA (%)	NOTATION
RESIDENTIAL 1	RESIDENTIAL 1	914	76.44	65.54	Yellow
BUSINESS 1	BUSINESS 1	9	2.81	2.41	Red
LIGHT INDUSTRIAL	LIGHT INDUSTRIAL	1	0.38	0.33	Magenta
MUNICIPAL	MULTI-PURPOSE CENTRE	1	0.34	0.27	Brown
EDUCATIONAL	SCHOOL/CRECHE	4	4.44	3.81	Blue
MUNICIPAL	THUSONG CENTRE	1	0.41	0.35	Grey
PLACE OF WORSHIP	PLACE OF WORSHIP	5	0.84	0.72	Cyan
PUBLIC OPEN SPACE	PUBLIC OPEN SPACE	6	3.18	2.72	Green
ROAD PURPOSES	STREETS		27.82	23.85	
TOTAL DEVELOPABLE AREA		941	116.66	100%	

Image 2: Proposed Layout (incl Land-use table)– Gemsbokspruit Development

2. Brief on Existing Networks

No electrical reticulation networks exists within the project envelope of the proposed Gembokspruit. Refer to images below.



Images 3: The Site, Gembokspruit

The proposed township is located approximately 9.3km east-northeast (straight line distance) from the Eskom Gembokspruit 132/22kV Substation - refer image 1

The Eskom Gembokspruit 132/22kV substation.



Images 4: Gembokspruit 132/22kV Substation

Transformers on the Gemsbokspruit substation 22kV feeder is used to step down the electricity from 22kV to 231-Volt for use in the adjacent township as indicated in the images below.



Images 6: Typical pole mounted, 22kV/231V transformers

Low Voltage (LV) electrical reticulation in the adjacent township is done with Aerial Bundled Conductors (ABC) on wooden poles with connections to the houses via concentric “airdac” concentric cables as indicated on the images below.



Images 7: Existing Low Voltage Aerial Bundled Conductor & Airdac reticulation networks

Metering is typically done using prepaid metering systems. Eskom will prescribe the metering requirements.

3. Estimated Electricity Demand

The bulk load requirements are calculated to be as follows:

Pts 4, 5, R/12, 13, & 22 of the farm Gemsbokspruit 229-JR						Rev 01	2021-04-28		
Notation	AREA OF ERF		PROPOSED ZONING	Units	FAR	DEVELOPABLE FLOOR AREA (m ²)	kVA/unit or VA/m ²	Unit	Total Load (kVA)
	Hectare	m ²							
	76.4400 Ha	764 400 m ²	Residential 1	914		—	2.4	kVA[ADMD]	2 193.6 kVA
	2.8100 Ha	28 100 m ²	Business 1	—	0.50	14 050.0 m ²	80	VA/m ²	1 124.0 kVA
	0.3800 Ha	3 800 m ²	Light Industrial	—	0.70	2 660.0 m ²	40	VA/m ²	106.4 kVA
	0.3400 Ha	3 400 m ²	Municipal	—	0.50	1 700.0 m ²	80	VA/m ²	136.0 kVA
	4.4400 Ha	44 400 m ²	Educational	—	0.40	17 760.0 m ²	20	VA/m ²	355.2 kVA
	0.4100 Ha	4 100 m ²	Municipal	—	0.60	2 460.0 m ²	80	VA/m ²	196.8 kVA
	0.8400 Ha	8 400 m ²	Place of Worship	5		—	13.8	kVA	69.0 kVA
	3.1800 Ha	31 800 m ²	P.O.S.	6		—	13.8	kVA	82.8 kVA
	88.8400 Ha	888 400 m²		925			SUB-TOTAL		4 263.8 kVA
							<i>Overall Diversity Factor Applied</i>		80%
							FINAL DEMAND		3 411.04 kVA
							FINAL DEMAND	Say	3 400 kVA

TOTAL ESTIMATED ELECTRICAL NOTIFIED MAXIMUM DEMAND

3 400 kVA

4. Available capacity

Inputs/Comment from Eskom with respect to available capacity at the Gemsbokspruit 132/22kV substation is still pending/outstanding.

During the site assessment conducted on 26 April it was noted that extensive upgrade & new built projects on the 22kV feeders from the Gemsbokspruit substation is currently in process.

It is expected that these works are part of the Eskom masterplan for the area to unlock additional electrical capacity and it must be assumed that the Gemsbokspruit Substation have sufficient spare capacity available to service development.

The above will be confirmed and the report updated accordingly once formal inputs/comments from Eskom is received.

5. Future Development

The proposed development comprises of the layout of a new settlement in accordance with town-planning best practices.

The electrification of the future development will be in compliance with the standards and specifications as prescribed by the Eskom.

6. Conclusion

The final estimated maximum demand for the new development is calculated to be 3 400 kVA (3.4MVA).

Given current new built & upgrade construction activities on the 22kV feeders from the Gemsbokspruit substation, it must be assumed that sufficient spare capacity will be available to service this proposed development but needs to be confirmed by Eskom.

7. Annexures:

Annexure 01: Enquiry submitted to Eskom.

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Annexure 01:

Email enquiry submitted to Eskom

From: Ralph Gordon
Sent: 28 April 2021 12:58
To: Francois Verwey <VerweyF@eskom.co.za>
Cc: Nico Van Wyk <nicovw@burotech.co.za>; Samuel Chauke (Nkanivo) <info@nkanivo.co.za>
Subject: RE: Gemsbokspruit - Eskom Enquiry
Sensitivity: Confidential

Good afternoon Francois,

I conducted a site visit on Monday and noticed quite a bit of construction work (*related to 22kV feeders lines*) taking place at Gemsbokspruit substation.

Any estimation when Eskom will be in a position to provide comment on my enquiries below?
 Many thanks!

Best Regards,



Ralph Gordon
 Buro Tech Consulting Engineers
 Tel: +27 (012) 542 1010
 Cell: 082 600 2537
Ralphg@burotech.co.za
www.burotech.co.za

From: Ralph Gordon
Sent: 16 April 2021 14:58
To: Francois Verwey <VerweyF@eskom.co.za>
Cc: Nico Van Wyk <nicovw@burotech.co.za>
Subject: Gemsbokspruit - Eskom Enquiry
Sensitivity: Confidential

Good afternoon Francois,
 We calculate the **demand** for the proposed development to be: **3 MVA** (*as per the following detail*)

Pts 4, 5,13, 22 & R/Ptn 12, Gemsbokspruit 229-JR						Rev 00	2021-04-16		
Notation	AREA OF ERF		PROPOSED ZONING	Units	FAR	DEVELOPABLE FLOOR AREA (m ²)	kVA/unit or VA/m ²	Unit	Total Load (kVA)
	Hectare	m ²							
	81.9500 Ha	819 500 m ²	Residential 1	748		—	2.4	kVA[ADMD]	1 790.40 kVA
	2.6200 Ha	26 200 m ²	Business 1	—	0.50	13 100.00 m ²	80	VA/m ²	1 048.00 kVA
	0.4100 Ha	4 100 m ²	Light Industrial	—	0.70	2 870.00 m ²	40	VA/m ²	114.80 kVA
	0.3500 Ha	3 500 m ²	Municipal	—	0.50	1 750.00 m ²	80	VA/m ²	140.00 kVA
	4.4500 Ha	44 500 m ²	Educational	—	0.40	17 800.00 m ²	20	VA/m ²	356.00 kVA
	0.4300 Ha	4 300 m ²	Municipal	—	0.60	2 580.00 m ²	80	VA/m ²	206.40 kVA
	0.7400 Ha	7 400 m ²	Place of Worship	4		—	13.8	kVA	55.20 kVA
	2.1500 Ha	21 500 m ²	P.O.S.	3		—	13.8	kVA	41.40 kVA
	73.1000 Ha	731 000 m ²		753					
SUB-TOTAL									3 752.20 kVA
Overall Diversity Factor Applied									80%
FINAL DEMAND									3 001.76 kVA
FINAL DEMAND								Say	3 000 kVA

For the purposes of the report we request Eskom comment/feedback on the following:

1. **SUBSTATION**

- 1.1. Substation name (Gemsbok SS?):
- 1.2. Voltage Levels (example: 132/11kV):
- 1.3. Capacity (example: 2x 10MVA):
- 1.4. Maximum Demand on the Sub:
- 1.5. Any upgrades/refurbishments etc to unlock sufficient capacity on the Eskom masterplaning?

2. MV networks

- 2.1. Name of the MV feeder supplying the area:
- 2.2. Feeder installed capacity:
- 2.3. Feeder maximum demand:
- 2.4. Any upgrades/refurbishment or new feeders planned for the area to unlock sufficient capacity:
- 2.5. A layout plan/Google Earth overview of the line (of possible):

As this project is at the pre-feasibility stage, we do not request a planning proposal.

- The objective is to report back to local government on the availability of Eskom infrastructure capacity in the area,
- Any upgrade plans/master plans Eskom may have in the area designed to unlock sufficient capacity,
- and ultimately report back to the local government on the feasibility of initiating this as a project (or not).
- Should the outcome of these investigations be positive, it will guide the local government to formally register the project & launch formal applications with Eskom.

I thank you for your assistance in this regard.

Best Regards,



Ralph Gordon

Buro Tech Consulting Engineers

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