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**Tel No:** 012 807 7445 / 083 277 7347  
**For Att:** Mr Samuel Chauke  
**Email:** [info@nkanivo.co.za](mailto:info@nkanivo.co.za)  
**Date:** 15 Nov 2021

**From:** Nico van Wyk  
**Cell No:** 082 600 8328  
**Email:** [nicovw@burotech.co.za](mailto:nicovw@burotech.co.za)  
**Page:** 1 of 14  
**Ref:** PK27 / DSN

**RE: PROPOSED TOWNSHIP DEVELOPMENT  
SITUATED ON PORTION 3 OF THE FARM DOORNPAN 193-IP  
ELECTRICAL SERVICES – BASIC OUTLINE SERVICES REPORT – Version 3**

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 – 26 May 2021

#### Version 2 :

Report Update – 21 July 2021

- Update to Township Layout
- Revise Electrical Demand Calculation i.t.o. Updated Township Layout
- Correction, Township Name

Paragraph 1  
Paragraphs 3 & 6  
Paragraph 2

#### Version 3 :

Report Update – 15 Nov 2021

- Update Township name to: "Tshing X11"
- Update with Amended Township Layout
- Revise Electrical Demand Calculation i.t.o. Amended Township Layout

Various locations  
Paragraph 1  
Paragraphs 3 & 6

Kindly contact us should any additional information be required.

Yours Faithfully

**Nico van Wyk** (Pr. Eng)

Cc: Nil

Enclosed: Report Version 3

Company Registration No  
CK 92/05979/23



# **ELECTRICAL SERVICES**

## **BASIC OUTLINE SERVICES REPORT**

### **PROPOSED TOWNSHIP DEVELOPMENT TSHING X11**

### **SITUATED ON PORTION 3 OF THE FARM DOORNPAN 193-IP**



**PREPARED BY:**

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DATE: 15 Nov 2021  
**Version 3**

PROJECT: PK27/DSN

# Contents

1. INTRODUCTION	2
2. BRIEF ON EXISTING NETWORKS	4
3. ESTIMATED ELECTRICITY DEMAND	6
4. AVAILABLE CAPACITY	6
5. FUTURE DEVELOPMENT	7
6. CONCLUSION	7
7. ANNEXURES:	7

# PROPOSED TOWNSHIP DEVELOPMENT – TSHING X11 SITUATED ON PORTION 3 OF THE FARM DOORNPAN 93-IP ELECTRICAL SERVICES– BASIC OUTLINE SERVICES REPORT

Date: 15 Nov 2021  
Version 3

## 1. Introduction

Nkanivo Development Consultants, the professional town planners for the proposed Tshing X11 situated on Portion 3 of the Farm Doornpan 193-IP, appointed Buro Tech Consulting Engineers on 04 May 2021 as the Specialist Electrical Engineers.

This report is based on information received from:

- Nkanivo Development Consultants on 04 May 2021, 21 July 2021 & 15 Nov 2021
- Eskom feedback related to Bulk Supply received on 13 May 2021
- Motla Consulting feedback related to master-planning, received on 19 May 2021
- Site assessment on 25 May 2021

Locality map showing the proposed Tshing X11 and the Eskom Ventersdorp Munic 88/11kV substation:

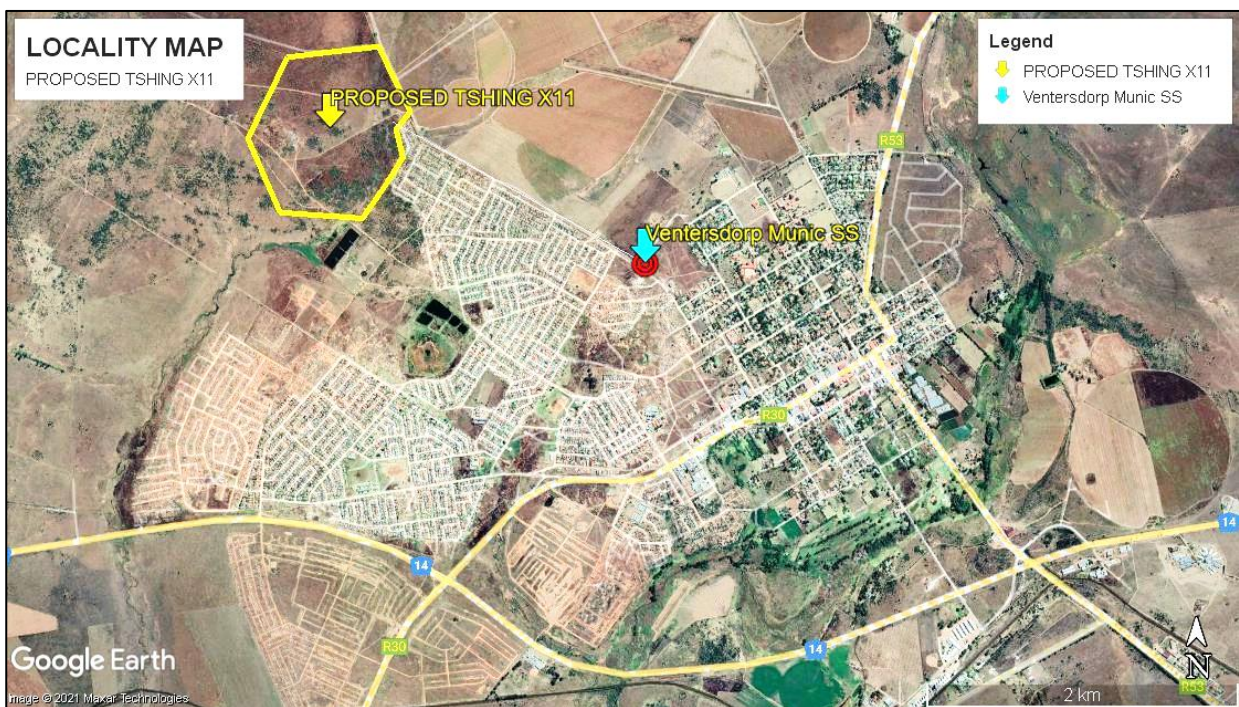
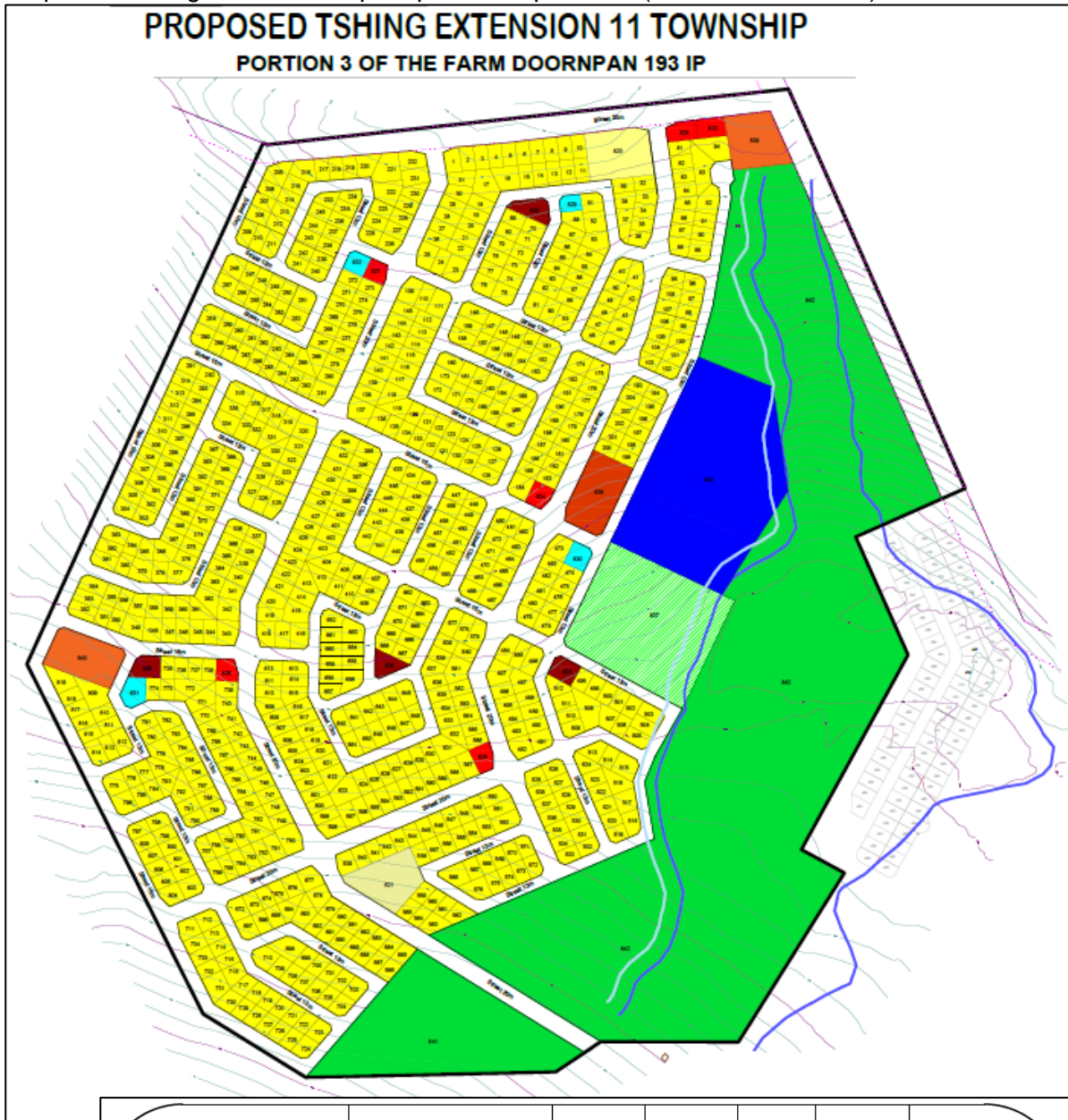


Image 1: Locality Map – Proposed Tshing X11 development



Proposed Tshing X11 Township as per Town planners (incl Land use table):



ZONING	LAND USES	ERVEN	TOTAL ERVEN	AREA (HA)	AREA (%)	NOTATION
RESIDENTIAL 1	DWELLING UNIT	1-819	819	36.76	41.56	Yellow
RESIDENTIAL 2	FLATS/GROUPS UNITS	820-821	2	0.82	0.93	Light Yellow
BUSINESS 1	COMMERCIAL USE	822-827	6	0.40	0.45	Red
INSTITUTIONAL	SCHOOL	828	1	3.29	3.71	Blue
INSTITUTIONAL	CRECHE	829-832	4	0.25	0.32	Cyan
INSTITUTIONAL	PUBLIC WORSHIP	833-836	4	0.31	0.35	Brown
RECREATIONAL	SPORTS CENTRE	837	1	1.93	2.18	Green with diagonal lines
GOVERNMENT	CLINIC	838	1	0.42	0.47	Orange
MUNICIPAL	MUNICIPAL PURPOSES	839-840	2	0.76	0.86	Light Green
PUBLIC OPEN SPACE	P.O.S	841-842	2	22.59	25.53	Green
STREET				20.93	23.66	
TOTAL DEVELOPABLE AREA			842	88.46	100%	

Image 2: Proposed Layout – Tshing X11 Development



## 2. Brief on Existing Networks

No electrical reticulation networks exist within the project envelope of the proposed Tshing X11. Refer to images below.



**Images 3: The Site, Proposed Tshing X11**

The proposed township is located approximately 1.9km North-West (straight line distance) from the Ventersburg Munic 88/11kV Substation. Medium Voltage (MV) electrical distribution to the area adjacent to the proposed Tshing X11 is done via existing 11kV overhead lines. The line is operated and maintained by the local municipality.

The Ventersburg Munic 88/11kV 2x 10MVA Substation:



**Images 4: Venterdorp Munic 88/11kV 2x 10MVA substation**



Transformers on the 11kV overhead lines are used to step down the electricity from 11kV to 231-Volt for use in the adjacent township as indicated in the images below:



**Images 5: Typical platform mounted, 11kV/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**

The Municipality will prescribe the metering requirements for new developments.

### 3. Estimated Electricity Demand

The bulk load requirements are calculated to be as follows:

PTN 3, DOORNPAN 193-IP							Rev 03	2021-11-15		
Notation	AREA OF ERF		PROPOSED ZONING	Density (Units/Ha)	Units	FAR	DEVELOPABLE FLOOR AREA (m <sup>2</sup> )	kVA/unit or VA/m <sup>2</sup>	Unit	Total Load (kVA)
	Hectare	m <sup>2</sup>								
1-819	36.7600 Ha	367 600 m <sup>2</sup>	Residential 1		819		—	2.4	kVA[ADMD]	1 965.60 kVA
820-821	0.8200 Ha	8 200 m <sup>2</sup>	Residential 2 (Flats/Groups)	80	65		—	2.4	kVA[ADMD]	156.00 kVA
822-827	0.4000 Ha	4 000 m <sup>2</sup>	Business 1		6	0.60	2 400.00 m <sup>2</sup>	80	VA/m <sup>2</sup>	192.00 kVA
828	3.2900 Ha	32 900 m <sup>2</sup>	Institutional: Educational, School		1	0.40	13 160.00 m <sup>2</sup>	20	VA/m <sup>2</sup>	263.20 kVA
829-832	0.2500 Ha	2 500 m <sup>2</sup>	Institutional: Creche		4		—	13.8	kVA	55.20 kVA
833-836	0.3100 Ha	3 100 m <sup>2</sup>	Institutional: Place of Worship		4		—	13.8	kVA	55.20 kVA
837	1.9300 Ha	19 300 m <sup>2</sup>	Recreational, Sport Centre		1	0.10	1 930.00 m <sup>2</sup>	80	VA/m <sup>2</sup>	154.40 kVA
838	0.4200 Ha	4 200 m <sup>2</sup>	Govt, Clinic		1	0.25	1 050.00 m <sup>2</sup>	80	VA/m <sup>2</sup>	84.00 kVA
839-840	0.7600 Ha	7 600 m <sup>2</sup>	Municipal		2	0.60	4 560.00 m <sup>2</sup>	80	VA/m <sup>2</sup>	364.80 kVA
841-842	22.5900 Ha	225 900 m <sup>2</sup>	P.O.S.		2		—	13.8	kVA	27.60 kVA
0	20.9300 Ha	209 300 m <sup>2</sup>	Streets		0		—			incl
<b>88.4600 Ha</b>		<b>884 600 m<sup>2</sup></b>			<b>905</b>			<b>SUB-TOTAL</b>		<b>3 318.00 kVA</b>
<i>Overall Density Factor Applied</i>										<b>80%</b>
<b>FINAL DEMAND</b>										<b>2 654.40 kVA</b>
<b>FINAL DEMAND Say</b>										<b>2 700 kVA</b>

**TOTAL ESTIMATED ELECTRICAL NOTIFIED MAXIMUM DEMAND**

**2 700 kVA**

### 4. Available capacity

Eskom Planning Engineers indicated that 2x 10MVA transformers are installed at Ventersburg Munic substation.

This means that the total installed capacity is 20MVA, and the firm installed capacity is 10MVA. Firm Installed Capacity: A Substation configuration where the one transformer serves as duty transformer, and the second as standby/back-up transformer.

Eskom indicated that a maximum demand of 12MVA was recorded, meaning the substation is operated over its firm installed capacity of 10MVA, but that 8MVA spare capacity is available in terms of the total installed capacity.

In the event of a single transformer failure, the substation will be overloaded.

The substation is very old and the equipment outdated, with availability of spares hampering proper maintenance & repairs.

Eskom Proposed the substation be upgraded to a 2x 20MVA substation to ensure adequate firm capacity be available, but awaits Municipal acceptance to proceed with an indicative cost estimate.

Extract of Eskom feedback received – refer addendum for full feedback:

1.3. Voltage Levels (eg 88/11kV): <b>Yes</b>
1.4. Capacity (example 2x 10MVA): <b>Yes</b>
1.5. Maximum Demand on SS: <b>12MVA</b>
1.6. Spare Capacity Available at SS: <b>8MVA and the municipality applied for NMD increase to 20MVA</b>
1.7. Any upgrade/refurbishment projects planned for the substation to unlock sufficient capacity: <b>Eskom proposed to install 2X20MVA transformers and we waiting for Municipal acceptance for Indicative Cost Estimate</b>



## **5. Future Development**

The proposed development comprises of the formalization of the existing informal residential 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 Municipality Electrical Engineering Department.

## **6. Conclusion**

The final estimated maximum demand for the new development is calculated to be 2 700 kVA (2.7MVA).

Eskom proposed the substation be upgraded to a 2x 20MVA substation to ensure adequate spare firm installed capacity to cater for this, and other future developments in the area, and will proceed with an Indicative Cost Estimate once they receive Municipal Acceptance.

## **7. Annexures:**

Eskom & Motla Feedback

~oo00oo~

# ESKOM COMMENT

**From:** Mbulelo Dala  
**Sent:** 13 May 2021 10:12  
**To:** Ralph Gordon  
**Subject:** RE: Proposed Doornpan 193-IP, PTN 3 - Request for Eskom Comments

Dear Ralph, please see my response below in red.



**From:** Ralph Gordon  
**Sent:** Monday, 10 May 2021 12:45  
**To:** Mbulelo Dala  
**Subject:** Proposed Doornpan 193-IP, PTN 3 - Request for Eskom Comments

Good afternoon Mbulelo,

We have been appointed as specialist electrical engineers to report on the proposed Township Establishment on: **Portion 3 of the Farm Doornpan 193-IP** under the jurisdiction of the JB Marks Local Municipality, in the North West Province.  
*Refer attached localities for your convenience.*

We are required to submit an electrical services report. The report will form part of a larger submission covering all disciplines, and ultimately set out to provide the relevant government department(s) with sufficient information to enable informed decisions to be made on the feasibility of taking this proposed development forward (or not). I thank you for your assistance in this regard.

The development will consist of we calculate the **demand to be 2 700 kVA**, as per the following detail:

PTN 3, DOORNPAN 193-IP						Rev 01	2021-05-10		
Notation	AREA OF ERF		PROPOSED ZONING	Units	FAR	DEVELOPABLE FLOOR AREA (m <sup>2</sup> )	kVA/unit or VA/m <sup>2</sup>	Unit	Total Load (kVA)
	Hectare	m <sup>2</sup>							
1-858	39.4500 Ha	394 500 m <sup>2</sup>	Residential 1	858		—	2.4	kVA[AD MD]	2 059.20 kVA
859-861	0.2800 Ha	2 800 m <sup>2</sup>	Business 1	3	0.60	1 680.00 m <sup>2</sup>	80	VA/m <sup>2</sup>	134.40 kVA
862	4.0100 Ha	40 100 m <sup>2</sup>	Educational, School	1	0.40	16 040.00 m <sup>2</sup>	20	VA/m <sup>2</sup>	320.80 kVA
863-866	0.5700 Ha	5 700 m <sup>2</sup>	Creche	4		—	13.8	kVA	55.20 kVA
867-870	0.6600 Ha	6 600 m <sup>2</sup>	Place of Worship	4		—	13.8	kVA	55.20 kVA
871	1.3400 Ha	13 400 m <sup>2</sup>	Recreational	1	0.10	1 340.00 m <sup>2</sup>	80	VA/m <sup>2</sup>	107.20 kVA
872	1.4700 Ha	14 700 m <sup>2</sup>	Govt, Clinic	1	0.25	3 675.00 m <sup>2</sup>	80	VA/m <sup>2</sup>	294.00 kVA
873	0.7600 Ha	7 600 m <sup>2</sup>	Municipal	1	0.60	4 560.00 m <sup>2</sup>	80	VA/m <sup>2</sup>	364.80 kVA
874-875	23.6700 Ha	236 700 m <sup>2</sup>	P. O. S.	2		—	13.8	kVA	27.60 kVA
72.2100 Ha		722 100 m <sup>2</sup>	875		SUB-TOTAL			3 418.40 kVA	
Overall Diversity Factor Applied									80%
FINAL DEMAND									2 734.72 kVA
FINAL DEMAND									Say 2 700 kVA

It would appear that the closest (& only) viable Eskom substation to this proposed development is Ventersdorp Munic SS.

So as to guide Eskom on the aspects we require Eskom's comment on, herewith the following questions:

## 1. SUBSTATION

1.1. Substation Name: Ventersdorp Munic SS (confirm) **Yes**

1.2. Substation Location: SUPPLIED (confirm) Yes (26°18'39.5"S 26°48'41.1"E)



- 1.3. Voltage Levels (eg 88/11kV): Yes
- 1.4. Capacity (example 2x 10MVA): Yes
- 1.5. Maximum Demand on SS: 12MVA
- 1.6. Spare Capacity Available at SS: 8MVA and the municipality applied for NMD increase to 20MVA
- 1.7. Any upgrade/refurbishment projects planned for the substation to unlock sufficient capacity: Eskom proposed to install 2X20MVA transformers and we waiting for Municipal acceptance for Indicative Cost Estimate

2. **MV network(s) Municipal Area of Supply (We don't have MV lines around the area). You also check with Motla Engineers because they are busy with a Master Plan for that municipality.**
- 2.1. Name & Voltage Level of the MV feeder supplying the area:
  - 2.2. Feeder installed capacity:
  - 2.3. Feeder maximum demand:
  - 2.4. Spare Capacity (if any):
  - 2.5. Any upgrade/refurbishment or new feeders planned for the area to unlock sufficient capacity:
  - 2.6. A layout plan/Google Earth overview of the line (of possible):

An overview (typically a geographical layout drawing) of any MV distribution/reticulation infrastructure that may be in the area for inclusion into the report.

As always, many thanks Mbulelo.

Best Regards,





**Ralph Gordon**  
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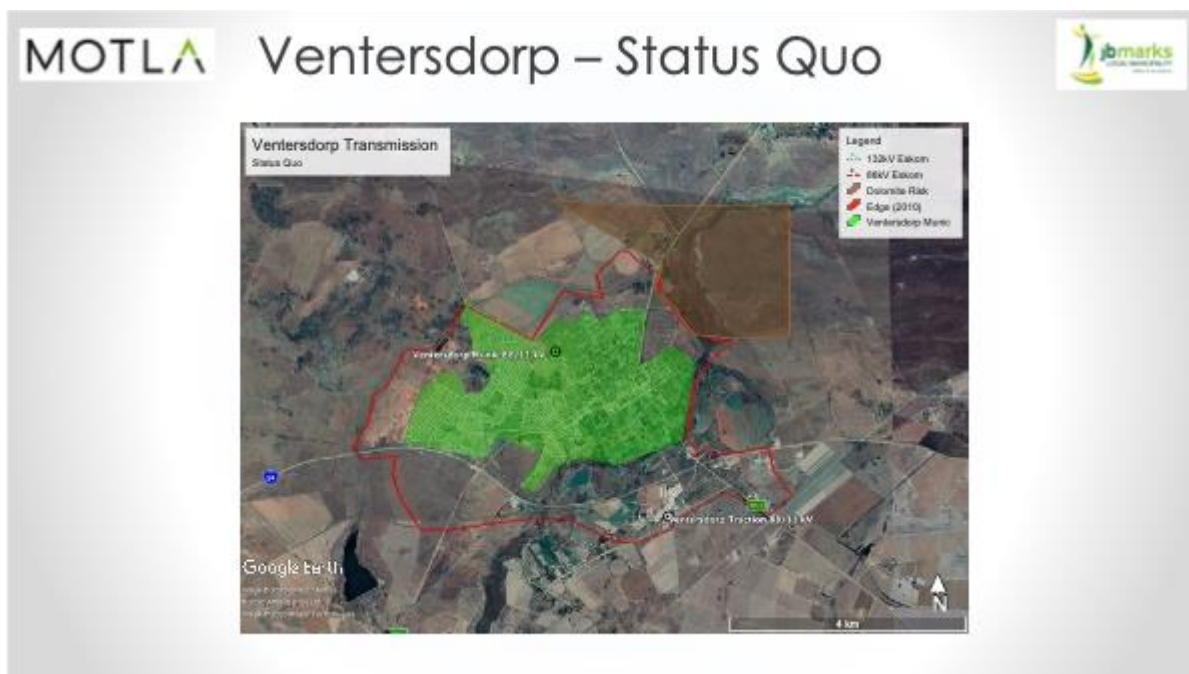
## MOTLA COMMENT

**From:** Chris Lombard  
**Sent:** 19 May 2021 14:49  
**To:** Ralph Gordon  
**Cc:** Mike Maki; Nico Van Wyk  
**Subject:** Re: Doornpan 193-IP, Ptn 3, Comment on capacity

Good day Ralph

Please find below summary slides and information on the Ventersdorp Master Planning  
The area identified is currently outside of the Urban Fringe, unless it has changed?  
In addition the existing 88/11kV munic substation does not have capacity, is very old and not in a good condition.  
However, the long term planning is for Eskom to upgrade the 88kV Watershed line to 132kV, as well as the substation and capacity.  
As per package no 2, which should make capacity available for such a development.  
But unfortunately we currently do not have any timelines for such a project from Eskom.  
Although I believe it can be initiated ...

Hope it helps  
Regards





**From:** Ralph Gordon  
**Date:** Monday, 17 May 2021 at 14:58  
**To:** Chris Lombard  
**Cc:** Mike Maki, Nico Van Wyk  
**Subject:** Doornpan 193-IP, Ptn 3, Comment on capacity

Good afternoon Chris,

As discussed earlier today, I have been appointed to assist with the compilation of an Electrical Services Report for submission as part of the township application process.

The outcome of the report would assist in determining the feasibility of the proposed development.

*Please refer to the attached for the location.*

In terms of the basket of rights, I calculate the demand of the proposed development to be 2 700 kVA.

I request comment/confirmation that the master planning as envisaged, will unlock sufficient capacity to enable the proposed development to proceed.

With thanks, much appreciated.

Best Regards,



**Ralph Gordon**

**Buro Tech Consulting Engineers**

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