



# VALUMAX DIEPSLOOT EXT 8 PROJECT

## ELECTRICAL SERVICES STATEMENT

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## 1 INTRODUCTION

Bigen Africa Services has been requested to provide an electrical services statement for the Diepsloot Ext 8 development. This will be used for the Scoping Report and Draft Environmental Impact Assessment (EIA).

### 1.1 Purpose of the Report

The purpose of this report is to provide information regarding the following.

- Existing electrical infrastructure & Servitudes
- Interim supply to the development,
- Bulk supply to the development,
- Internal electrical design; and
- Cost estimates for the development.

### 1.2 Background

The proposed Diepsloot Ext 8 development will consist of approximately 4000 - 6000 housing units. Valumax will develop 1000 units as a phase 1. This development requires large amounts of electric power to be made available to the eventual tenants and owners of the various structures.

## 2 SITE DESCRIPTION

### 2.1 Locality

The location of the proposed Diepsloot Ext 8 development is at co-ordinates: **S25.95316 E28.01085 (Degrees decimal)**. The metropolitan area is Johannesburg. The proposed development is located on the southern side of Diepsloot and the northern side of Dainfern.

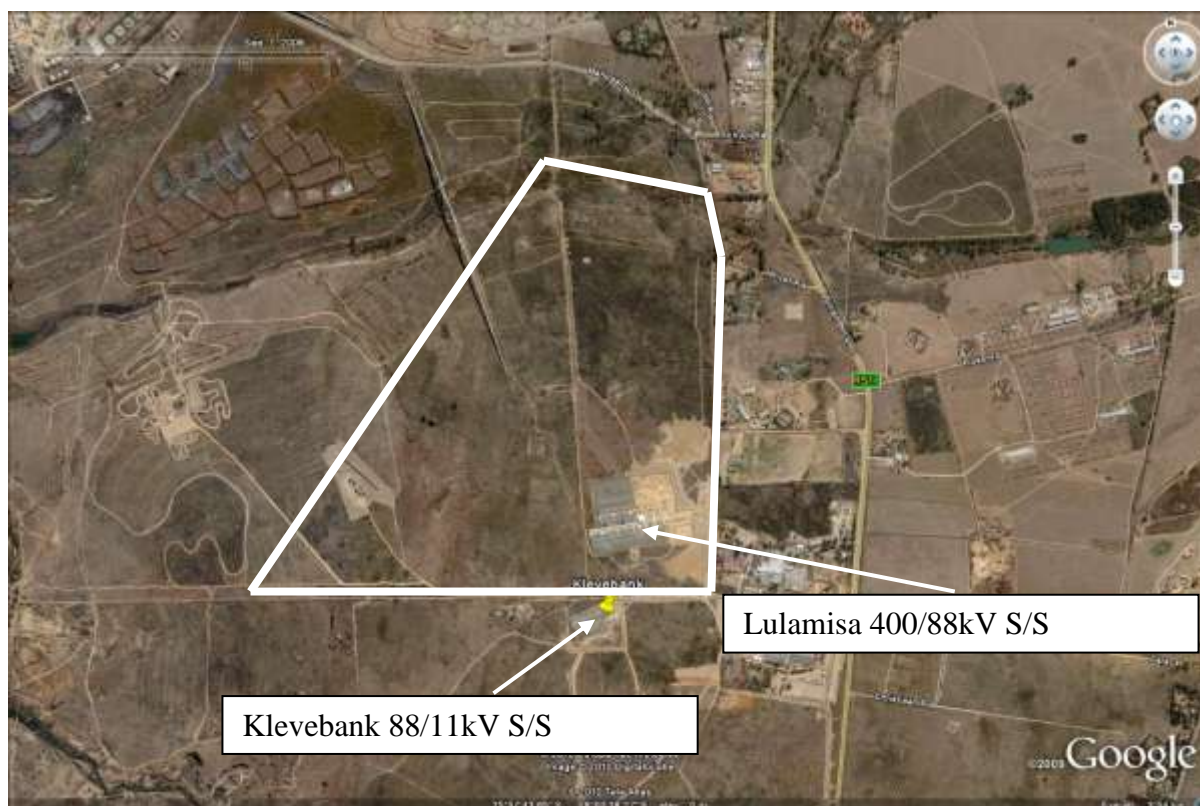


**Figure 1 – Location**

## **2.2 Existing Electrical Infrastructure & Servitudes**

The electrical supply authority for the area is Eskom. Klevebank 88/11 kV Substation is situated on the southern boundary of Northern Farms. Klevebank 88/11kV substation is being supplied by the Lulamisa 400/88kV substation, which is located on the development property. The two substations are shown below in figure 2.

An 88kV line with registered servitude 7934/1973 passes through the area. Adjacent to it, there are also two 400kV transmission line servitudes. The three above servitudes occupy a total width of 102m. One of the transmission line servitudes is vacant and has been illegally occupied by informal settlers. Another 22m servitude for distribution 88kV has already been paid for and passes through the development area. This is to be moved next to the road servitude as indicated in appendix A1.



**Figure 2 – Lulamisa 400/88 kV S/S & Klevebank 88/11 kV S/S**

### **3 ELECTRICAL SUPPLY**

#### **3.1 Interim Supply to the Development**

Klevebank substation does not have sufficient capacity to supply this development. It can only provide about 3 MVA interim power supply for the first phase of the development. This is sufficient to supply 1000 to 1200 dwelling units.

#### **3.2 Bulk Electrical Infrastructure**

The bulk supply for the development will come from Eskom's planned Diepsloot South substation. Eskom's planning for the construction of a new substation for the development has already started.



The proposed site for the new substation as well as the line servitudes have to be included in the town planning and EIA processes. 11kV cables will cross the wetland from the proposed new substation to the new development adjacent to the existing Eskom cables.

### 3.3 Bulk Requirements

**Table 1 - Bulk Requirements 6000 units**

Zoning	No of Units	Housing Type/ Zoning	Wm <sup>-2</sup> /ADMD <sub>100</sub>	Total Bulk
Housing units	6000	RDP/GAP/Social	3.5 kVA	21 MVA
<b>Total</b>				<b>21 MVA</b>

The estimated Bulk Supply costs for this development is R60 000 000.00.

## 4 ELECTRICAL DESIGN

All the internal designs will be completed according to the Eskom and City of Johannesburg specifications as the internal network will be handed over to them.

### 4.1 Medium Voltage Reticulation

The medium voltage network will be an 11kV overhead conductor network feeding a configuration of 50kVA, 100kVA and 200kVA pole-mount transformers. The above is more economical for low-cost housing. Alternatively it can be an 11kV underground network feeding a configuration of 315kVA and 500kVA miniature substations. The miniature substations will be connected via a 185mm<sup>2</sup> PILC/XLPE copper cable ring networks.

If economically feasible, switching stations might also be deployed within the development.

## 4.2 Low Voltage Reticulation

For the residential land portions, the low voltage network will be either underground cable network or overhead aerial bundle conductor supplied from the different substations. The supply voltage will be 420/240V with a regulation of +12% / -12%. The internal low voltage reticulation will be fed from the miniature substations up to cluster cabinets or pole mount distribution enclosures. The LV feeder cable/bundle conductor sizes from the miniature substations will be determined at the final design stage. The following sizes of PVC/ABC insulated cable sizes will be applicable.

Cable Size (mm <sup>2</sup> )
25mm <sup>2</sup>
35mm <sup>2</sup>
50mm <sup>2</sup>
70mm <sup>2</sup>
95mm <sup>2</sup>
120mm <sup>2</sup>

## 4.3 Service Connection

Each stand will be connected through an overhead airdac or underground cable. All underground road crossings will be through sleeves.

## 4.4 Street and Area Lighting

The street lighting will be a separate network with control gear (where LV reticulation is overhead bundle conductor a streetlight core is included in the bundle), The proposed streetlights will be standard street light fittings with 0.5 to 10.0m outreach, installed at a 5m mounting height on steel galvanized poles or on the LV conductor structures. The typical 70 W HPS or 125 W MV or equivalent type can be used. The street lighting will be fed from the control panel within the miniature substations. 10mm<sup>2</sup> PVC insulate 3-core copper cable with a 10mm<sup>2</sup> bare copper earth wire will be used to connect all the individual street lights.

## 5 ESTIMATED CONSTRUCTION COST

### 5.1 Funding Requirements – Cost Estimates

The funding requirements will be as follows:

**Table 2 - Cost Estimate for Overhead Reticulation – Phase 1 only**

Cost Estimate (overhead system)	
Internal infrastructure Residential (R13289/ stand)	R 13 289 000.00
Link Line Cost Estimate	R 1 500 000.00
<b>Sub Total</b>	<b>R 14 789 000.00</b>
<b>Contingencies @ 10%</b>	<b>R 1 478 900.00</b>
<b>Construction Total</b>	<b>R 16 267 900.00</b>
Estimated Professional Fees	R 1 610 535.89
<b>Total</b>	<b>R 17 878 435.89</b>

**Table 3 - Cost Estimate for Underground Reticulation – Phase 1 only**

Cost Estimate (underground system)	
Internal infrastructure Residential (R19781/ stand)	R 19 781 000.00
Link Line Cost Estimate	R 1 500 000.00
<b>Sub Total</b>	<b>R 21 281 000.00</b>
<b>Contingencies @ 10%</b>	<b>R 2 128 100.00</b>
<b>Construction Total</b>	<b>R 23 409 100.00</b>
Estimated Professional Fees	R 2 175 404.81
<b>Total</b>	<b>R 25 584 504.81</b>

It should be noted that the pricing of infrastructure (especially an underground system) can be affected quite dramatically by the price of copper, steel and plastics.

#### Notes

- Excluding VAT
- Infrastructure cost up to individual stand boundary
- Infrastructure cost includes Bulk (estimate only), MV, LV and street lighting
- All insurance costs are excluded (estimated at 10% of contract value)



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## Appendix A1: Locality Plan