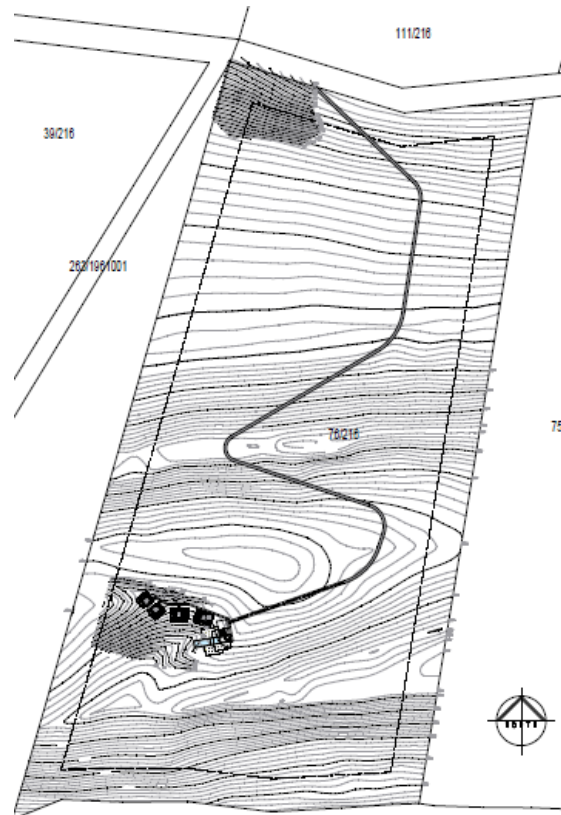


**PROPOSED NEW DEVELOPMENT ON PORTION 76 OF THE FARM UITZICHT NO 216,  
DIVISION KNYSNA,  
WESTERN CAPE**



Submitted by:

**BDE** Consulting Engineers

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## 1 INTRODUCTION AND SCOPE

This electrical engineering services report covers the external bulk electricity supply (municipal point of supply) or own generation to the proposed Development.

The supply authority is Knysna Municipality.

Annexures to this report:

- Annexure A – Municipal electrical supply
- Annexure B – Typical solar system

The development will be for a residential property.

## 2 LOCATION



The farm is located to the West of Brenton on Sea (South of the Main Entrance Road as indicated above).

## 3 EXISTING INFRASTRUCTURE

There is no existing electrical infrastructure on the farm or the adjacent road reserve to the North.

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The closest electrical network is located at CR Swart Drive to the North and to the East as per Annexure A in Magenta colour.

The far distance to the nearest network also dictates the usage of 11000 V lines should this be the chosen option and also private property crossings where servitudes will be required.

#### **4 EXPECTED DEMAND**

The maximum expected electricity after diversity demand (ADMD) for the development is 15 kVA.

The maximum demand as indicated will be impacted by any energy saving measures implemented as well as the final design.

#### **5 CAPACITY OF THE EXISTING ELECTRICAL network**

The nearest network is a 11000 V supply with adequate capacity but far away.

#### **6 PROPOSED ELECTRICITY DISTRIBUTION NETWORK**

The recommended electricity network is a Solar generation network with a diesel generator.

##### **6.1 Municipal supply**

The option of a municipal supply cable is only indicated here for information purposes. The new network installation and all costs will be the responsibility of the developer and not the supply authority irrespective of whether Solar or Municipal supply is chosen. The distance of the house from the municipal network is too far for a low voltage network and will therefore require an intermediate 3300 Volt system up to the main house – This option is not explored further as a Solar system is recommended. The costs of a municipal supply network can be from R 476 000.00 up to R 616 000.00 excl VAT. Please see Annexure A attached in this regard.

##### **6.2 Solar plant**

###### **6.2.1 Type and system**

The solar plant shall be an Off- Grid installation where the sun powers the load during the day and the batteries at night.

Grid-Tie PV Inverters can also be connected to this micro-grid (AC Coupling) should the demand exceed the generation.

###### **6.2.2 Plant location**

A roof mounted plant is recommended and to be installed on the roofs of the main house and the out building units should more generating capacity be required.

The main house Northern face roof (assumed 46m<sup>2</sup>) can fit about 23 panels (7 kW)

###### **6.2.3 Plant capacity**

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The current proposed system is a 15 kWp system.

The peak usage is estimated to peak at 30 kwh per day but permanent residence is not envisaged at this stage.

#### 6.2.4 Energy Storage

A Lithium Iron Phosphate sealed battery system is proposed with a lifetime of more than 10 years (@70% depth of discharge) as well as a quick charging time.

#### 6.2.5 Distribution Network

A small distribution network of underground cabling will be required from the main house to all the units. A trench of 450mm wide and 800mm deep is normally excavated to bury the cables or this can be fixed to walkways on cable trays.

Remote equipment requiring electricity like boreholes can be self-sustained (Solar pump) with a dedicated panel or alternatively a cable can be laid depending on the position from the main house should this be allowed.

### 6.3 Consumption Metering

There will be no municipal electricity metering.

### 6.4 Area/Street lighting

Road lighting will be low intensity, low level, bollard type luminaires powered individually by a small solar cell and only activate with motion.

## 7 ENVIRONMENTAL IMPACT

### 7.1 Impact on existing electricity consumers

The development will have a minimal effect on the quality of supply to the existing customers due to the fact that the development will be off-grid.

### 7.2 Environmental impact

The entire internal electrical distribution network will be carefully designed to blend in with the development as well as the natural environment as a whole. All structures, equipment and switchgear will be low profile following natural contours.

The colours and shapes of all structures, equipment and switchgear, will be selected carefully to blend in with the environment.

Services will generally be located within the road reserves to prevent additional disturbance of vegetation. The environmental management plan for the development will form an integral part of the specification and requirements for the electrical construction work.

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## 8 ENERGY EFFICIENCY AND RENEWABLE ENERGY

The use of cost effective alternative energy sources, such as gas and LED lighting will be considered as well as the installation of energy efficient installations as required by the National Building regulations.

Energy efficient equipment will also lower the demand and consumption for a smaller solar system.

## 9 CONCLUSION

A solar system with minimal environmental impact is proposed for the development but with Generator back-up.

A municipal electrical supply is possible but not recommended due to the costs.

Please contact BDE should there be further details required.

Yours faithfully



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Danie de Vries Pr.Eng.

On behalf of **BDE CONSULTING ENGINEERS**

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