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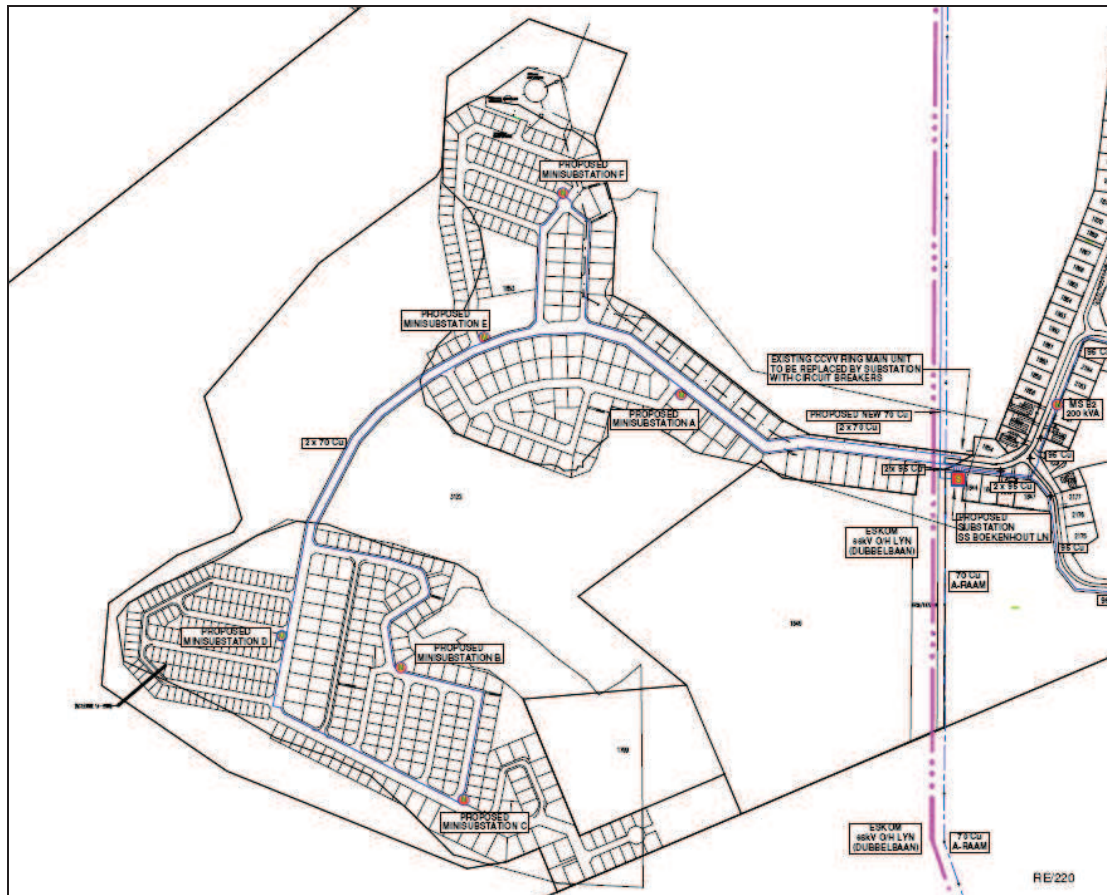
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PROPOSED NEW DEVELOPMENT ON ERF 3122, HARTENBOS, WESTERN CAPE

ELECTRO TECHNICAL REPORT FOR THE EXTERNAL AND INTERNAL SERVICES

Submitted by:

BDE Consulting Engineers

06 October 2010

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1. INTRODUCTION

This electrical engineering services report covers the external bulk electricity supply as well as the internal electrical distribution network to the proposed new development on erf 3122, Hartenbos in the Western Cape.

The proposed development consists of the following:

- 173 Single residential erven;
- 182 Group housing units;
- 162 Retirement village units;
- Commercial erven;
- Bowls Field.

The development is within the licensed electricity distribution area of Mossel Bay Municipality.

2. EXISTING INFRASTRUCTURE

The existing infrastructure in the vicinity of the development is supplied directly from a 20 MVA 66/11kV Eskom substation, SS Sonskynvallei.

An 11kV network feeds various substations, compact switchgear and miniature substations in the area. The development will be supplied directly from the 66/11kV substation via suitably rated 11kV cable.

3. CAPACITY OF THE EXISTING ELECTRICAL INFRASTRUCTURE

The Municipality indicated that sufficient capacity for this development is available at the 66/11kV Sonskyn Substation. This will be confirmed by the Municipality.

4. EXPECTED DEMAND

The maximum expected electricity demand for the development is close to 1,850 kVA and the average demand 1,110 kVA.

The use of energy efficient installations and a central load management system could save up to 40% on electricity consumption and the peak demand could be reduced by up to 20%.

The estimated load for the development is calculated as follows:

Description	Units	Load (BDMD)	Load (ADMD)	Total Load
Single residential erven	173	13.8	4.5	778.5
Group housing units	182	12	3	546
Retirement village units	162	12	3	486
Commercial erven	1	500	500	500
Total Load Requirement				2310.5
Utilisation Factor				0.8
Total Load Requirement				1848.4

5. MUNICIPALITY

The standard Municipal Augmentation fees and tariffs will be applicable.

6. PROPOSED ELECTRICITY DISTRIBUTION NETWORK

After construction, the complete 11kV distribution network, including the reticulation of the residential units, will remain the responsibility of the Municipality.

Details of the proposed electrical distribution network is summarised as follows:

6.1. Point of supply

The development will be supplied directly from a 20 MVA 66/11kV Eskom substation, SS Sonskynvallei, via suitably rated 11kV cable.

6.2. Consumption metering

All areas of the development will be individually metered by the Municipality. This includes residential, commercial and general supplies.

6.3. Medium voltage network

A servitude should be registered in favour of the Municipality on the proposed development for a switching substation. An 11kV cable system feeding from a circuit breaker at the 66/11kV substation (point of supply); shall feed up to a proposed new switching substation.

This switching substation will replace the existing switchgear at the entrance of the development. The existing municipal infrastructure up to the switching unit shall be extended to the proposed new switching station.

The development shall be supplied from the above mentioned switching station via suitably rated switchgear and an 11kV ring-feed system. This 11kV ring-feed system will supply various miniature substations throughout the development.

6.4. Low voltage network

The low voltage distribution system will be supplied from the above mini-substations via underground cable supplying strategically positioned distribution kiosks. The supply cables to the kiosks will be protected with optimally specified feeder breakers housed inside the mini-substations.

6.5. Service connections

Service connections will be done with underground cable from the distribution kiosks, ending 1 meter x 1 meter inside each single residential site and/or at a connection box on the external wall of other buildings as applicable;

6.6. Street lighting

Energy efficient type street lighting will be introduced, positioned according to the final design. Luminaires will be of the low level, low glare type.

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 supplied directly from a proposed 66/11kV substation, which will have adequate capacity.

7.2. Impact on the operating costs

The development will have no negative effect on the electrical operating costs of the Municipality, due to the fact that the complete electrical infrastructure required for the development will be supplied, installed and operated by the Developer. Maintenance on the proposed electrical network will be minimal due to the proposed complete underground distribution system that will be provided. Electricity sales to the development will in actual fact contribute to the profits made by the electricity service of the Municipality.

7.3. 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. Switchgear containing transformer oil will be installed in a manner that will prevent the spilling of any oil.

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.

8. ENERGY EFFICIENCY

The Municipality support the utilisation of energy efficiency and renewable energy. The objectives of the energy efficient requirements are as follows:

- To ensure the right fuel or energy source is used for end applications;
- To avoid wasteful and misuse of scarce national energy resources;
- To encourage the deployment of all energy resources in a prudent and environmentally responsible manner.

Although practical and economical considerations will be taking into account, energy efficiency requirements should be considered and implemented to the maximum effect.

Lighting:

It is advised that only reliable and approved light energy sources be considered. Therefore only Compact Fluorescent Lights (CFL) and Sodium Vapour (SV) lamps will be utilised. Due to environmental constraints, no Mercury Vapour (MV) lights will be considered. A saving of up to 60% is possible when utilising CFL rather than MV lamps.

Streetlights will also be controlled by day/night switches to ensure that all lights will be switched off during the day. No incandescent lights should be used and all security lights should be controlled with motion sensors.

Geysers:

The energy consumption in a geyser could be reduced by an average of 60% by the use of solar heating.

Electrical infrastructure:

The design must be done by a registered professional engineer to ensure the use of appropriate electrical conductor sizes that will minimise the distribution losses.

Buildings:

The energy needs could be reduced by up to 70% through design principles.

This is known as passive solar design and includes:

- Building orientation
- Roof design
- Window design, solar glazing
- Skylights
- Insulation
- Floor substances
- Etc.

9. CONCLUSION

Communication between BDE and the Municipality regarding the bulk supply for the development is summarised as follows:

The point of supply is a circuit breaker at the existing 20MVA 66/11kV Sonskynvallei substation. The following shall apply:

- A servitude should be registered in favour of the Municipality on the proposed development for a switching substation.
- An 11kV cable system feeding from a circuit breaker at the 66/11kV substation (point of supply); shall feed up to a proposed new switching substation.
- This switching substation will replace the existing switchgear at the entrance of the development. The existing municipal infrastructure up to the switching unit shall be extended to the proposed new switching station.
- The development shall be supplied from the above mentioned switching station via suitably rated switchgear and an 11kV ring-feed system.
- This 11kV ring-feed system will supply various miniature substations throughout the development.