



de villiers & moore
CONSULTING ENGINEERS
Electrical, Mechanical, Fire

Our Ref: R53521/L004
Date: 2025-04-17

Your Ref:

The Municipal Manager
Knysna Municipality
Electrotechnical Department

Attention: Mr. Tshepo Lehaba

Sir

KNYSNA: BOKMAKIERE STREET: FREEDOM CHURCH: ERF 2589 & 2590
PROPOSED UPGRADE OF BULK SERVICES: REV 001

This report has been compiled by de Villiers & Moore Consulting Engineers, having been instructed our client with purpose of informing the team of the extent of the electrical bulk services required to be put into place to provide the electrical supply to the Development.

LOCATION

The Church Building is situated on erf 2589 & 2590 in Bokmakierie Street in the administrative district of KNYSNA Municipality.



Fig.1&2) Image of existing church building (street view) and position of the two respective erven.



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SUPPLY AUTHORITY

The Development is situated in the electrical supply area of Knysna Municipality.

DRAWINGS

Attached is the Architect's design, dated Nov 2024.

PHASING OF THE DEVELOPMENT

The Development will be done in sub phases.

EXISTING ELECTRICAL DISTRIBUTION NETWORK

There is an existing municipal MK (Meter Kiosk) fed from a 500KVA MS (Mini Substation), approximately 450m away, situated in Heron Street. The MS' 300A sub MCCB (Moulded Case Circuit Breaker) supplies the BMK - residential single-phase loads, as well as the 80A 3phase feed to the existing church building.



Fig. 3&4) Street kiosk fed from MS in Heron Street providing 60A 1ph to houses and 80A 3ph to the church building

DEMAND REQUIREMENTS

The demand calculated for the total required load after the upgrade of the new church building is 175KVA, and this will be taken into account when calculating the Development Charges as well as the capacity on the existing network.

AREA SCHEDULE			
ERF 2589 & 2590, KNYSNA	SITE AREA: 3 855m²		
	ALLOWED	ACHIEVED	
ZONING	SPECIAL		
HEIGHT OF BUILDINGS	8,5m	8,5m	
COVERAGE	60 %	74% (@ 2865m²)	
F.A.R	1.2 (4 626m²)	1.13 (@ 4 393m²)	
BUILDING AREAS			
	EXISTING	NEW BUILDING	
GROUND FLOOR	645m²	2 182m²	
FIRST FLOOR	345m²	1 221m²	
TOTAL	990m²	3 403m²	4 393m²
PARKING CALCULATION			
1BAY/ 8 SEATS	138 BAYS (1100seats/8)	144 BAYS (1 bay/ 8seats)	
BUILDING LINES			
6M ALONG STREET FRONTAGE			
1.5M ALONG SIDE BOUNDARIES (TO BE RELAXED)			

Table 1) Area schedule of new upgraded church building

Demand calculations:

$$4393\text{m}^2 \times 40\text{W (mixed load)} = 175,7\text{KW}.$$

Thus, a 250A new connection will be required.

PROPOSED ELECTRICAL LV DISTRIBUTION NETWORK

The closest 315KVA mini substation (MS) currently in place has been located in Dikkop Street. This MS was been logged by De Villiers & Moore on the LV 450A Main MCCB and there is sufficient capacity to supply the intended development with a 250A direct supply.



Fig.5) Picture of MS in Dikkop Street



Fig.6) Picture of DVM' Landis & Gyr Logger clipped onto main 450A MCCB

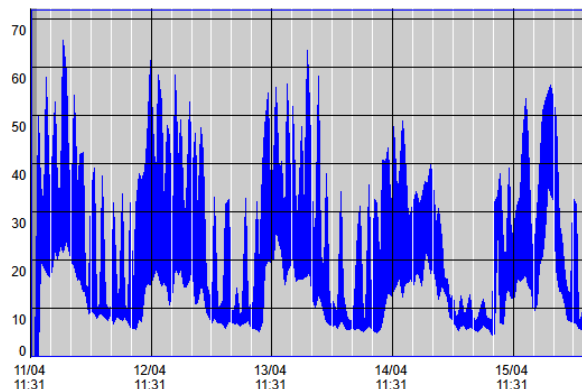


Fig.7) Graph of Landis & Gyr Logger displaying a Max of 65KVA

Point of Connection

A 250A MCCB will be mounted in the 315KVA MS and there is a spare MCCB which could be moved or replaced with the new 250A MCCB. From this point, a new underground LV copper feeder would be routed to a new LV Bulk Metering Kiosk – to be installed at the entrance to the Development. From the LV Bulk Metering Kiosk, the low voltage reticulation will be installed to supply the main point of supply.

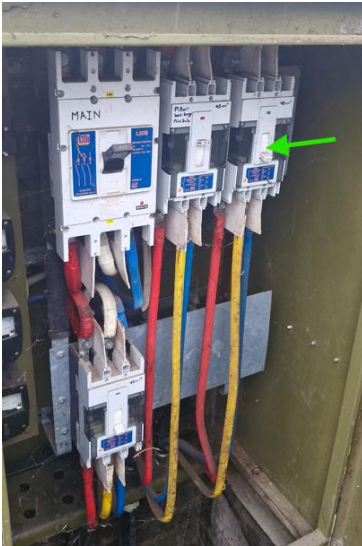


Fig.8) Seems to be a spare/line breaker not in use (could be replaced with 250A MCCB)

Capacity Calculations

315KVA (MS max capacity) – 65KVA (existing load) = 250KVA

175KVA is required of the remaining 250KVA

The new estimated load + current load = 65KVA + 175KVA = 240KVA

This implicates a maximum load factor of 76% on the 315KVA MS

Distance for new proposed cable (underground) 1 x 150mm ² (Cu)	= 238m,
Calculated voltage drops	= 4.4%
Current carrying capacity	= 387A



Fig.9) Layout of proposed cable route taken from the MS to feed the dedicated new BMK for the church premises

Detailed design drawings will be submitted to the KNYSNA Municipality prior to final approval for comment and subsequent approval.

METERING AND RESPONSIBILITY

On completion of the installation and after the one-year guarantee period, the responsibilities will be as follows:

- The Knysna Municipality will be responsible for the maintenance of the cable supplying the bulk metering kiosk as well as the LV Bulk Metering Kiosk.
- The low voltage network including the low voltage cables from this LV Bulk Metering Kiosk will be the responsibility of the Client.
- The Client will receive one electrical account from the Knysna Municipality

ENERGY SAVING MEASURES

The use of the following equipment will be made mandatory:

- Water heating to be done using gas or heat pumps.
- Lighting to make use of LED lamps only.
- Use of motion sensor lighting control.
- Photovoltaic Systems will be encouraged.

COST ESTIMATE AND ELECTRICAL DEVELOPMENT CHARGES

The Client will be responsible for all costs associated with the supply and installation of the electrical infrastructure required to service the Development.

A detailed design of the proposed low voltage and earthing will be submitted to Knysna Municipality for approval prior to construction commencing on site.

A detailed cost estimate will be submitted as part of a different reporting process.

The building upgrade will attract Development Charges as published in the Municipal Tariff Structure.

The estimated cost for the capital contributions

for the MV contribution is R268 233-57 inclusive of Vat calculated as follows

$8,7\text{ERU} @ R30\ 846-86/\text{ERU} = R268\ 233-57$.

for the LV contribution R inclusive of Vat calculated as follows

$(120\text{kVA}/315\text{kVA}) \times R1\ 000\ 000-00 = R380\ 000-00$

It is noted that the amount is adjusted each year at the end of June.

IMPACT

1. Impact on Existing Electricity Consumers

The development will have no detrimental effect on the quality of supply to the existing consumers due to the fact that the development will be supplied by its own LV feeder directly from an existing mini-substation.

2) Impact on Distribution Authority Operating Costs

The development will have no negative effect on the electrical costs of the distribution authority, due to the fact that the complete electrical infrastructure required for the development will be supplied and installed by the Developer.

3) Impact on the Environment

The internal electrical infrastructure design will take into account energy saving technologies which may include load control, the use of energy efficient lighting, the use of alternative means of water heating and inverter type HVAC equipment

CONCLUSION

We trust the information provided is of sufficient detail to allow for an informed decision to be made. Please do not hesitate to contact the undersigned should additional information be required.

Yours faithfully



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