ELANDSHEUWEL 337 & 338

ELECTRICAL SERVICES REPORT

For

MAXIM PLANNING SOLUTIONS

DOCUMENT CONTROL INFORMATION

DOCUMENT INFORMATION	
Document Name	ELANDSHEUWEL 337 & 338
Document Type	Electrical Services Report
Document Number	2021 – DM21/002
Version	Rev00
Issue Date	07/02/2022

DOCUMENT HISTORY			
Version	**Date**	**Author**	**Summary of Changes**
Rev00	07/02/2022	C.P. TERBLANCHE	Original

DOCUMENT APPROVAL			
Action	**Name / Designation**	**Signature**	**Date**
Prepared by	C.P. TERBLANCHE Pr. Tech Eng; Pr. PMSA Project Management; GCC (Electrical) MSAICE; MSAIEE		07/02/2022

DOCUMENT DISTRIBUTION	
No.	**Issued to**
1	MAXIM PLANNING SOLUTIONS
2	-

TABLE OF CONTENTS

DOCUMENT CONTROL INFORMATION ..... **i**

TABLE OF CONTENTS ..... **i**

1. Introduction **1**

1.1 PROJECT BRIEF 1
1.2 AIM OF THIS REPORT 1
1.3 STRUCTURE OF THE REPORT 1
1.4 PROFESSIONAL SERVICE TEAM 1
1.5 REFERENCE DOCUMENTATION 1

2. DEVELOPMENT INFORMATION **2**

2.1 GEOGRAPHICAL POSITION 2
2.2 LICENSED SUPPLY AREA 2
2.3 ELECTRICAL SUPPLY AREA 2
2.4 PROGRAMME & PHASING 2
2.5 SOCIO-ECONOMIC INFORMATION 3
2.6 SPATIAL DEVELOPMENT PLAN 4

3. DESIGN PARAMETERS **5**

3.1 GENERAL 5
3.2 DESIGN REQUIREMENTS 5
3.3 DESIGN PARAMETERS 5

4. SUPPLY AUTHORITY REQUIREMENTS **7**

4.1 GENERAL 7
4.2 APPLICATION & APPROVAL 7
4.3 CONSTRUCTION & HANDING-OVER 7
4.4 REVENUE COLLECTION & INFRASTRUCTURE RESPONSIBILITY 8

5. MAXIMUM DEMAND **9**

5.1 DEMAND ESTIMATION 9
5.2 LOAD GROWTH 10
5.3 ENERGY EFFICIENCY (EE) MEASURES 10

6. ELECTRICAL SERVICES **11**

6.1 BULK SUPPLY 11
6.2 MV RETICULATION 11
6.3 LV RETICULATION 11
6.4 SERVICE CONNECTIONS 12
6.5 BULK SERVICE CONNECTIONS 13
6.6 STREET AND AREA LIGHTING 13
6.7 COMMUNICATION SERVICES 13
6.8 SERVITUDES 13
6.9 METERING & INFRASTRUCTURE RESPONSIBILITY 13
6.10 DETAIL DESIGN 13

7. COSTS **14**

7.1 GENERAL 14
7.2 ELECTRICAL SERVICES 14
7.3 BULK CONTRIBUTION COST 14
7.4 CONNECTION COST 14

ANNEXURES **15**

1. INTRODUCTION

1.1 Project brief

The project brief is understood as follows:

a) Proposed mixed residential and commercial development is being planned In Matlosana Smart City Development.
b) The proposed development is as indicated in the site development plan (SDP) as received by Maxim Planning Solutions.
c) Electrical services are required for the development.
d) Electrical services include, bulk supply, distribution of supply, area / street lighting, point of connection for stands / buildings and internal small power and lighting,
e) The main objective at the time of this report was a services report to determine if bulk supply is available and the process of going forward.

1.2 Aim of this report

The aim of this report is to provide the necessary information for the purpose of providing electrical services for the proposed development. This information is intended to be used by Developer and Professional parties involved in order to determine the feasibility of the proposed development and act as a formal services report for review and approval by the Supply Authority.

1.3 Structure of the report

The report begins by identifying the position and defining the relevant land use information of the development. There-after the design parameters and supply authority requirements are summarized. The report continues by summarizing the estimated maximum demand and described the proposed electrical services that will be required. The report is closed with a cost estimation and fay word / conclusion summary.

Any additional documentation is presented in the appendices of this report.

1.4 Professional service team

At the time of this report, it is understood that MAXIM PLANNING SOLUTIONS and that DM CONSULTING ENGINEERS (PTY) LTD are responsible for the Electrical services of the development.

1.5 Reference documentation

The following reference documentation forms part of this report.

Table 1: Reference documentation

Item	Document number	Document description
1	-	- Letter from Matlosana Local Municipality
2	-	-
3	-	-

2. DEVELOPMENT INFORMATION

2.1 Geographical position

The proposed development is located in the town of KLERKSDORP, North West, adjacent LEEMHUIS STRAAT, ELANDSHEUWEL, KLERKSDORP.

Figure 1: Geographical Position

2.2 Licensed supply area

The Development is situated within the licensed supply area and jurisdiction of CITY OF MATLOSA Municipality.

Location details: 26°50'51.98"S 26°39'1.52"E

Contact details: David Rannona 018 – 487 8709

2.3 Electrical supply area

The proposed development falls under the City of Matlosana Municipality, Electrical Licensed Area.

Location details: Braamfisher & Oliver Tambo Street, Klerksdorp

Contact details: Contact details: David Rannona 018 – 487 8709

2.4 Program & phasing

The program and phasing at the time of this report was not known. It is expected that the design and procurement stage of the project will take ± 3 months and the complete construction and occupational / utilization will take ± 4 months. The total expected time for complete construction and utilization is expected to take ± 18 months.

A more detailed program will be developed after the feasibility stage.

2.5 Socio-economic information

The area is intended for a mixed residential and commercial (predominately residential) development.

With the information at hand during this investigation, the residential portion of the development is classified as “Township Area”, based and highlighted in red on the following table.

It is however important to note that the development can be classified as “Urban Res 2”, based and highlighted in orange on the following table.

Table 2: Classification of domestic consumer

It is important to determine and finalize the classification, because this will have a large impact on the maximum demand calculation.

1	2	3	4	5
Consumer load class	**Derivation of income**	**Description of dwellings**	**Type of roads**	**Water reticulation**
Rural settlement	Mainly from pensions and subsistence farming. Some breadwinners work far away in cities	Mainly based on traditional construction methods	Normally tracks with difficult access	Normally none
Rural village	From pensions and subsistence farming. Some breadwinners are employed in nearby industrialized areas and commute daily	Mixture of modern and traditional construction methods	Mainly gravel with main roads tarred	Some communal stand-pipes
Informal settlement	From work in a nearby town/city – largely from the informal sector	A range from shacks to newer "government subsidy" houses made from blocks Self-build schemes fall into this category Built area of dwellings generally less than 40 m^2	A range, from tracks in informal areas to gravel in planned areas	None in informal areas Planned areas generally have water piped to a tap in the yard of each dwelling
Township area	From work in cities/towns, pensions and some informal employment	A range from low-income flats to old township houses and newer government scheme houses (mid-range), to small semi-detached houses Built area of dwellings generally 50 m^2 – 80 m^2	Mostly tarred	Piped to most houses – half of which eventually have working electrical hot-water cylinders
Urban residential I	From blue-collar jobs in cities	Houses ranging in size from 80 m^2 – 170 m^2. Most houses have some visible repair/maintenance in progress	All tarred	Piped to all houses
Urban residential II	From formal employment in cities, mostly white-collar jobs	The built-area of main dwellings is typically 190 m^2. None of the houses are multistorey	All tarred	Piped to all houses, all of which have electrical hot-water cylinders
Urban townhouse complex	Mainly from professional jobs in cities, level of employment is high	Normally very-high density, in complexes that incorporate security or other shared services. Dwellings are single or multi-storey. Floor area in the range 80 m^2 – 150 m^2 per unit.	All tarred	Piped to all houses. A high percentage of such houses have multiple electrical hot-water cylinders
Urban multi-story/estate	Mainly from professional jobs in cities, level of employment is very high	Large, constructed of brick or concrete, floor area 250 m^2 – 500 m^2 In regions with some desirable natural feature (e.g. a view)		

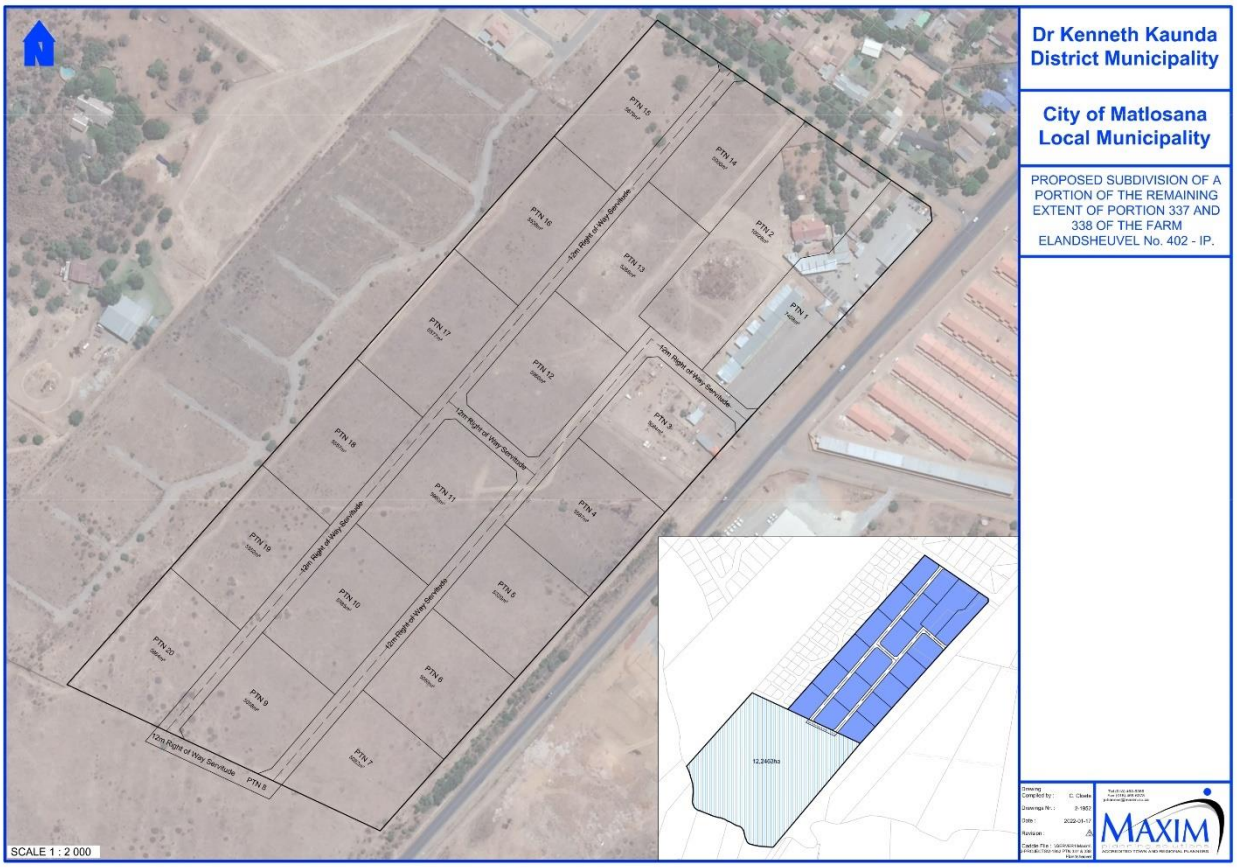
Figure 1

2.6 Development plan

The spatial development plan is outlined in the following figure.

Figure 2: Development plan

The layout of the development plan consists out of the main areas.



The land use information is summarized in the following table.

Table 3: Land use information

Refer to the appendices for this report for the detailed spatial development plan (SDP).

Item	ZONING	NUMBER OF URBAN DENSITY	RESIDENTIAL	*BUSINESS*	*EDUCATIONAL*	MEDICAL INSTITUTES	FILLING STATION	TAXI RANK	OLD AGE HOME	COMMUNITY HALL	TOTAL RESIDENTIAL	TOTAL BUSINESS
1	Residential (Res 2)		25									
2	BUSINESS (7458²)			80vA per m²								
3	SCHOOLS											
4	COLLEGE											
5	CLINIC											
6	MEDICAL CENTRE											
7	FILLING STATION											
8	TAXI RANK											
9	OLD AGE HOME											
10	COMMUNITY HALL											
	Total		***25***								***25***	

3. DESIGN PARAMETERS

3.1 General

Electrical services will be designed towards an economic trade-off between financial constraints and optimum technology by taking the following into consideration:

a) Statutory voltage & thermal limits;
b) Acceptable supply availability and reliability;
c) Financing constraints and affordability; &
d) Acceptable aesthetics and safety.

3.2 Design requirements

The electrical infrastructure will be designed to comply with the standards and requirements of the, in accordance with, but not limited to the following:

a) All electrical services shall be designed and constructed in terms of the standards and specification of the Supply Authority, statutory regulation of RSA and technical standards of IEC, SANS, NRS & ISO.

b) Equipment selection shall comply with the types and ranges of the supply authority and the specific conditions of the area and only reputable manufacture type equipment being tested in SA industry with the necessary SABS certification and IP rating shall be accepted.

c) NRS 034-1:1999 Electricity Distribution – Guidelines for the provision of electrical distribution networks in residential areas.

d) SANS 10142-1 The Wiring of Premises – Low Voltage Installations.

e) SANS 10142-2 The Wiring of Premises – Medium Voltage Installation above 1kV not exceeding 22kV.

f) The electricity distribution system will be designed for the anticipated maximum load to avoid the need for future upgrading of the electricity distribution system.

g) The maximum demand will be calculated in accordance with (but not limited to) SANS 204 Energy Efficiency in Building, SANS 10142-1 The Wiring of Premises – Low Voltage Installations & SANS 10400 Part X & XA Application of the National Building Act – Energy Usage.

h) Street lighting will be designed to comply with the standards and requirements of the Supply Authority, where appropriate, in accordance with (but not limited to) SANS 1098: Part 1–2: Public Lighting.

i) Where applicable, the Developer will provide traffic lights, designed to comply with the standards and requirements of the Supply Authority, where appropriate, in accordance with (but not limited to) SANS 1459 Traffic Lights.

3.3 Design parameters

The following design parameters have been verified with the Supply Authority and have been taken into consideration.

Table 4: Design parameters (Provisionary design parameters)

Item	Description	Unit	Parameters
1	**System**		
	Source	ea	New Miniature Substation 315(kVA)
	Nominal System Voltage	kV	11kV/400V
	Frequency	Hz	50
	Phase Rotation	ea	R-Y-B anti-clockwise
	Nominal Voltage @ Source	%	0.98

	3 Phase fault Level @ Source	kA	2.6 / 5.3
2	**Design Limits**		
	Voltage Drop	%	±10%
	MV & LV Cable Thermal Loading	%	80%
	TRF Thermal Loading	%	80%
3	**Power Cables**		**MV-PVC/XLPE : LV-PVC/XLPE**
	Max sustained conductor temp	˚C	70/90 : 70/90
	Ground temperature	˚C	25 : 25
	Ambient air temp	˚C	30 : 30
	Ground Thermal Resistivity	K.m/W	1.2 : 1.2
	Direct solar radiation	W/m²	-
	Depth of laying	mm	800 : 500
4	**Insulation Levels (Min)**	**Nominal Voltage**	**11 / 0.4 kV**
	Maximum System Voltage	kV	12 / 0.6
	Rated Short duration power-frequency rms withstand voltage	kV	28 / 0.8
	Rate peak lightning impulse withstand voltage	kV	95 / 8
5	**Rated current levels (Min)**	**Nominal Voltage**	**11 / 0.4 kV**
	Rated short-time withstand rms current	kA	25 / 25 /
	Rate peak withstand current	kA	63 / 63 /
6	**Clearances (Min)**	**Nominal Voltage**	**11 / 0.4 kV**
	Min Air Clearance - P to G	mm	320 / 200 /
	Min Air Clearance - P to P	mm	430 / 270 /
	Min Working Clearance - Vr	mm	2800 / 2700 /
	Min Working Clearance - Hr	mm	1400 / 1300 /
7	**Equipment Range**	**ea**	**Range**
	MSS	ea	315kVA, 11/0.4kV Dyn11
	Pole TRF	ea	n/a
	MV Overhead	ea	n/a
	MV Cable	ea	35/50/70/95/120/150 mm²; 3 Core; Cu; 11/11kV
	LV Cable	ea	16/25/35/50/70/95/120/150 mm², 3/4 Core; Cu
	LV Overhead	ea	25/35/50/70/95; ABC
	LV Service Cable	ea	10/16 mm², 3/4 Core
	Metering Kiosks	ea	3/6/9/12 Way
8	**Communication**	**ea**	None
9	**Earthing**		
	Substations	ea	Earthing System < 1Ω.
	Miniature Substation	ea	Earthing System < 1Ω.
	Kiosks	ea	Earth Rod + BCEW Continuity Conductor.
	Customers	ea	Separate Earth
10	**Metering**		
	Full Title Stand	ea	MV / LV Point of Connection
	Sectional Title	ea	MV / LV Bulk Connection
	Security Village	ea	MV / LV Bulk Connection
	< 800kVA	ea	MV Bulk Connection

4. SUPPLY AUTHORITY REQUIREMENTS

4.1 General:

The rules and guidelines of City of Matlosana Municipality will have to be followed with regards to application for approval, construction, revenue collection and infrastructure responsibility.

4.2 Application & approval:

a) A formal application and service report must be submitted to the supply authority for review and formal feedback. Bulk capacity and infrastructure proposal cannot be confirmed without a formal application.

b) The supply authority will give formal feedback if bulk capacity is available or not, what infrastructure refurbishment / upgrade works will be required, all standards and specifications and corresponding infrastructure and bulk contribution budget costs.

c) Upon acceptance of the budget costs, will the supply authority start with a detail design and formalize the corresponding costs.

d) The developer accepts the conditions as set out in the “formal application” and that all connection costs and any other costs with regards to special arrangements are paid.

e) The Supply Authority reserves the right to only confirm the availability of bulk supply capacity at final application thereof.

f) All bulk services contribution charges paid in full.

g) Services agreement is drafted, reviewed and signed between all applicable parties.

4.3 Construction & handing-over:

a) There are two options for construction, option 1 (supply authority build) is where the supply authority is responsible for the design, procurement and construction and option 2 (self-build) is where the developer is responsible for the design, procurement and construction. Option 2 (self-build) is recommended due to the time constraint on the supply authorities’ side.

b) The developer may only use pre-approved consulting engineers for the design and electrical contractor for the construction works.

c) Detail designs shall be submitted for review and approval by the Supply Authority before construction can commence.

d) The electrical infrastructure must be tested and approved on the conditions laid down by the Supply Authority.

e) The Supply Authority will authorize the energizing of the electrical network once the final tests have been successfully passed.

f) A provisional asset register will be submitted to the Supply Authority once the design documentation has been approved. This asset register will be updated once the services have been installed and the network accepted by the Supply Authority.

g) Ownership of electrical services, will be transferred from the developer to the Supply Authority upon the successful testing and commissioning of the services. The Supply Authority will therefore be responsible for the maintenance of the electrical services.

4.4 Revenue collection & infrastructure responsibility

Ownership as well as responsibility for revenue collection for the Supply Authority ends at the Point of Connection (POC), defined as the where the Supply Authorities' meters are installed. After the POC, ownership and revenue collection are the responsibility of the Developer.

The Supply Authority will determine the type of Point of Connection (POC) and the position there-off will be determined at detail design phase. Either individual Low Voltage (LV) connection or Low Voltage (LV) Bulk Connection (BC), where a Bulk Meter Kiosk / Board is to be provided and/or Medium Voltage (MV) Bulk Connection (BC), where a Ring Main Unit (RMU) and Metering Unit (MU) is to be provided.

General rules / policy:

h) Each registered stand shall receive a Point of Connection (POC);
i) Sectional title estate/complex will be provided with a LV or MV Bulk Connection, whereby full title estate/complex will be provided with a LV Connection for each stand;
j) Where the Maximum Demand for the proposed development > 500kVA, the Supply Authority will require a metered Medium Voltage (MV) Bulk Connection.
k) Where the development or parts there-off are envisioned as a full or sectional title security village, the Supply Authority will require a LV or MV Bulk Connection.

5. MAXIMUM DEMAND

5.1 Demand estimation

The maximum demand for the proposed development is based on the SDP and calculated in accordance with the requirements as set out in SANS 10142-1, SANS 204 & NRS 034.

Based on the geographical position of the development, the commercial / business load values highlighted in yellow are chosen.

Table 5: Commercial / Business Benchmark Values

Class	Description of Building	Maximum Energy Consumption (VA/m²)					
		1	2	3	4	5	6
A1	Entertainment and Public Assembly	85	80	90	80	80	85
A2	Theatrical and Indoor Sport	85	80	90	80	80	85
A3	Places of Instruction	80	75	85	75	75	80
A4	Workshop	80	75	85	75	75	80
F1	Large Shop	90	85	95	85	85	90
G1	Offices	80	75	85	75	75	80
H1	Hotel	90	85	95	85	85	90

Based on the consumer load class, the residential load values highlighted in yellow are chosen.

Table 6: Residential Benchmark Values

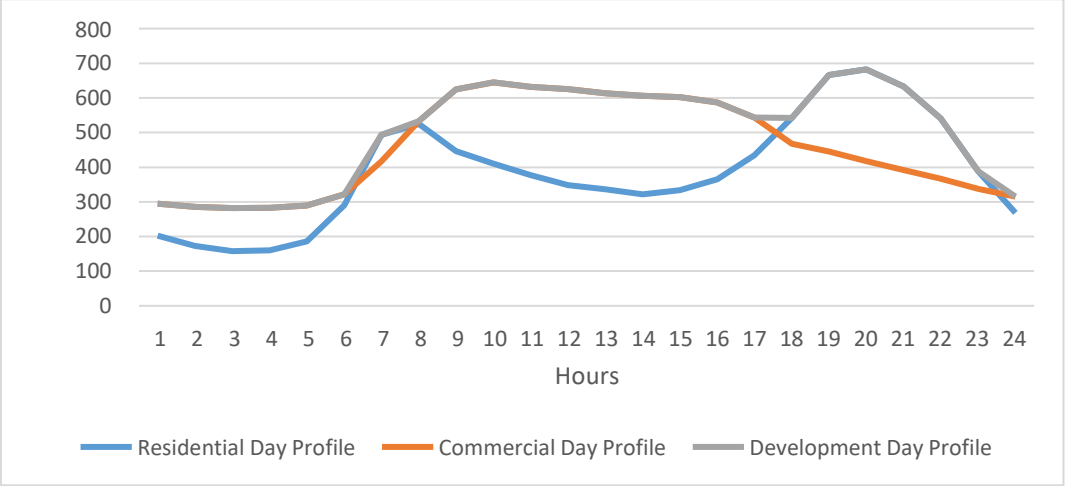
Item	Consumer Classes	Class Code	ADMD
1	Rural Settlement	LSM 1 (low end)	0,5
2	Rural Village	LSM 1 and 2	0,84
3	Informal Settlement	LSM 3 and 4	1,3
4	Township Area	LSM 5 and 6	2,37
5	Urban Residential I	LSM 7	3,59
6	Urban Residential II	LSM 7 and 8	4,72
7	Urban Township Complex	LSM 8	4,7
8	Urban Multi Story / Estate	LSM 8 (high end)	5,3

The Maximum demand calculation for the development is shown in the following table and figure.

Table 7: Maximum demand estimation

Item	ZONING	NUMBER OF URBAN DENSITY	RESIDENTIAL	*BUSINESS*	*EDUCATIONAL*	MEDICAL INSTITUTES	FILLING STATION	TAXI RANK	COMMUNITY HALL	TOTAL RESIDENTIAL ADMD	TOTAL BUSINESS ADMD	TOTAL KVA
1	Residential (Res 2)		25									
2	BUSINESS (7458²)			80vA per m²								
3	SCHOOLS											
4	COLLEGE											
5	CLINIC											
6	MEDICAL CENTRE											
7	FILLING STATION											
8	TAXI RANK											
9	COMMUNITY HALL											
	Total		***25***							***118***	***600***	***718***

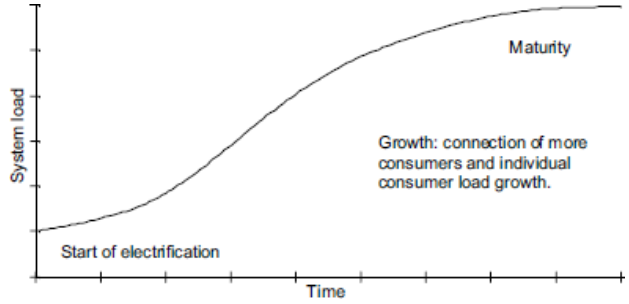
Figure 3: Maximum demand estimation



5.2 Load growth.

The growth and sequential increase in demand is expected to follow a s-curve as indicated in the figure below.

Figure 4: Typical s-curve



The development is linked to the economy but to social housing requirements as well. It is expected that the development will take? years to be fully build and occupied.

5.3 Energy Efficiency (EE) measures

It is recommended to consider the implementation of energy efficient measures. The following standards can be used as a guideline.

a) SANS 204 Energy Efficiency in Building &
b) SANS 10400 Part X & XA Application of the National Building Act – Energy Usage.

Architectural point of design:

a) Aluminum windows, larger northern openings to maximize solar radiation in winter and minimize it in summer;
b) Smaller southern windows to prevent cold radiation in winter; &
c) Correct orientation, north facing.

From an energy usage point of design:

a) Energy efficient electrical stoves or Gas stoves;
b) Gas and/or Solar geysers or Heat pumps;
c) Energy efficient lighting such as LED's; &
d) Solar PV.

6. ELECTRICAL SERVICES

6.1 Bulk supply

The developments fall within City of Matlosana Municipality supplied area 11kV/315kVA, miniature substation, located in center of development. The substation load 80% at 252kVA.

The Developer will install a new 315kVA Miniature Substation in the center of the development which will open up capacity for the new development. Initial talks indicated that this capacity can be available based on the development expecting to be fully build and occupied 18 months.

The development is linked to the economy but to social housing requirements as well. It is expected that the development will take 18 months to be fully build and occupied.

6.2 MV reticulation

Electrical capacity will be created for the development by way of a 11kV/400V Miniature Sub Station from corner of Ian and Wilke Avenue, Elandsheuwel 11kV/400V substation through the development and forming a ring as indicated in the figure below.

The bulk application will be divided in 315VA capacity. The final timeframe is not determined)

The 11kV MV overhead network will make use of 3 Core Copper/uc PLIX table 18 11kV cable. The detail design will determine the conductor size in order to comply with thermal and voltage drop limits.

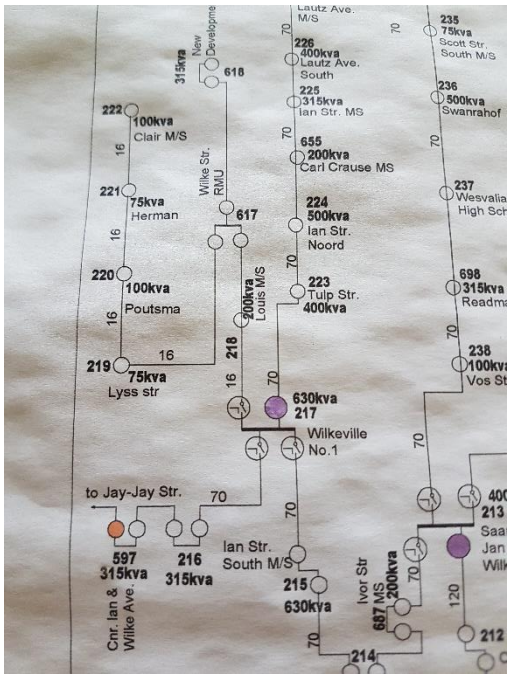
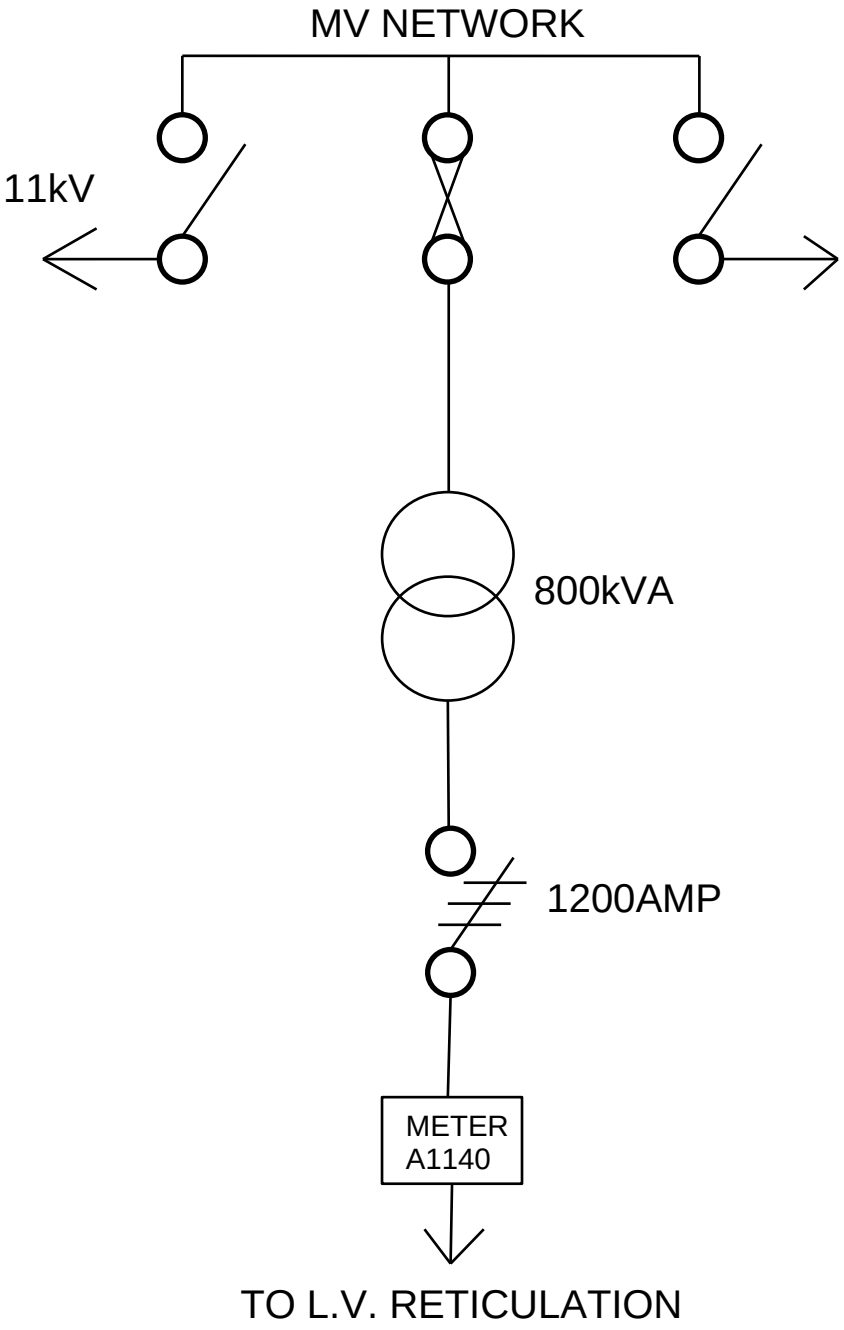


Figure 5: MV reticulation network - Representation example

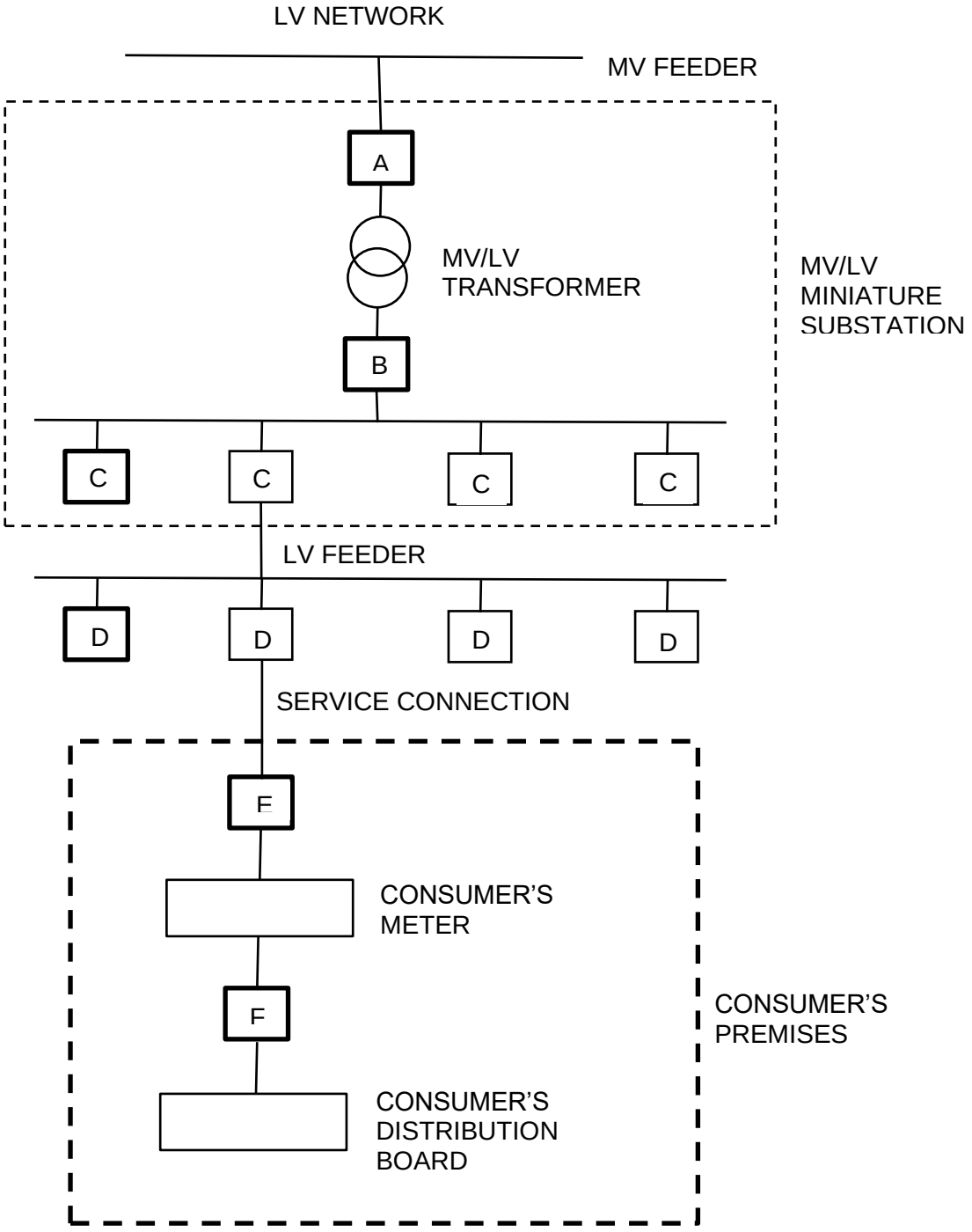


6.3 LV reticulation

Minisub station will create capacity and electricity will be distributed throughout the development by way of an 400V Low Voltage (LV) underground network forming in radial network configuration as indicated in the figure below.

This underground network will make use of PVC cable as per type as per SANS1418 and installed at 600mm underground. The detail design will determine the cable size in order to comply with thermal and voltage drop limits.

Figure 6: LV reticulation network – Representation example



6.4 Service connections

Low Voltage (LV) service connections will be provided to each stand from a kiosk withthe installation of an underground (UG) 10/16mm², 3 Core, PVC/SWA/PVC/PVC, Cu 1mm2 x2 Comms or overhead (OH) 10/16mm² Airdac SNE type cable.

6.5 Bulk service connections

No MV bulk connections will be made available.

LV bulk connections will be provided for various development units.

6.6 Street and area lighting

Street and area lighting can be established by post mounted street lights of type (27W LED) mounted on 8-12m wooded, concrete or steel poles or area high mast lights of the type (276W LED) mounted on 15-30m steel masts.

Primary roads depending the defined volume of traffic will be classified as B1 & B2 and secondary roads will be classified as B3 as per the SANS 10098 table below.

Table 8: Street and area lighting classifications

Lighting category	Type of street	Minimum average horizontal illuminance	Minimum horizontal illuminance	Minimum semi cylindrical illuminance
B1	Residential streets with medium to high volume traffic	5 lux	1 lux	2 lux
B2	Residential streets with medium volume traffic	3 lux	0,6 lux	1 lux
B3	Residential street with low volume traffic	2 lux	0,4 lux	0,6 lux
C1	Wholly pedestrian in City Centre	10 lux	3 lux	7,5 lux
C2	Wholly pedestrian in local shopping malls	7,5 lux	1,5 lux	3 lux

6.7 Communication services

No provision is made for communication services.

6.8 Servitudes

No servitudes at the time of this report were identified.

6.9 Metering & infrastructure responsibility

Split pre-paid meters will be installed for each stand from where metering will occur.

The supply authority City of Matlosana Municipality will take over the MV, LV and street light reticulation.

6.10 Detail design

The detail of the above will be determined during the detail design phase of the project, dependent on the final spatial development plan (SPD).

7. COSTS

7.1 General

Costs are based on high level estimations and deemed ±60% accurate for the purpose of determining the feasibility of the project / development.

Costs can only be calculated more accurately with a preliminary and/or detail design as well as a formal application to the supply authority.

7.2 Electrical services

A cost estimation for electrical services is calculated and summarized in the following table.

Table 9: Electrical services cost estimation

Description	Unit	Rate (R)	Qty (Stands)	Amount (R)
Installation Cost to Point of Supply	R/stand	48 431.42	20	968 628.40

QUANTITY LIST: - SUMMARY		
ITEM	DESCRIPTION	TENDER AMOUNT (R)
BILL NO. 1	MEDIUM VOLTAGE DISTRIBUTION & MINIATURE SUBSTATION	R 250 000
BILL NO. 2	LOW VOLTAGE DISTRIBUTION	R 640 628
BILL NO. 3	AREA LIGHTS	R 78 000
TOTAL CONTRACT WORK (EXCLUDING 15% VAT)		**R 968 628**

7.3 Bulk contribution cost

Bulk contribution costs are costs payable to the Supply Authority for the larger network shared between developments. In other words, more than one development is benefitting. These costs are calculated by the Supply Authority and should be formally communicated.

If the developer is responsible for the provision of bulk infrastructure to ensure supply, these costs can be discounted against the bulk services contribution charge depending on the agreement between the parties.

The bulk contribution cost estimation is summarized in the following table.

Table 10: Bulk contribution cost estimation (In process)

Description	Unit	Rate (R)	Qty (kVA)	Amount (R)
Bulk Contributions	R/kVA	459.60	315	144 774

7.4 Connection cost

Connection costs are costs payable to the Supply Authority for the smaller municipal network only for the benefit of the specific development.

These costs are calculated by the Supply Authority once a formal application has been submitted and should be formally communicated.

If the developer is responsible for the provision of the service connection infrastructure to ensure supply, these costs can be discounted against the connection costs depending on the agreement between the parties.

******* END OF REPORT *******

ANNEXURES

A) LAY OUT PLAN