

**8. CONSIDERATION OF MATTERS REFERRED TO COUNCIL VIA THE MAYORAL COMMITTEE MEETING/S (3/4/2/5)**

**8.1 REQUEST TO INCLUDE FURTHER DELEGATION(S) TO THE CURRENT SYSTEM OF DELEGATIONS**

*File number* : 3/P/7

*Compiled by* : Environmental Planner (S van der Merwe)

*Report by* : Director: Planning & Economic Development

*Delegated Authority* : Council

***Strategic intent of item***

Preferred investment destination	<input type="checkbox"/>
Greenest municipality	<input type="checkbox"/>
Safest valley	<input type="checkbox"/>
Dignified Living	<input type="checkbox"/>
Good Governance	<input checked="" type="checkbox"/>

**1. PURPOSE OF REPORT**

To submit a proposed delegation to be added to the current System of Delegations to Council for approval.

**2. BACKGROUND**

Section 59 of the Local Government: Municipal Systems Act No 32 of 2000 (the Systems Act) requires that:

*“A Municipal Council must develop a system of delegation that will maximise administrative and operational efficiency and provide for adequate checks and balances...”*

**3. DISCUSSION**

The current System of Delegations does not allow the municipality to comment on environmental impact assessments undertaken in terms of the National Environmental Management Act, 107 of 1998 (NEMA), within the prescribed legal timeframe.

It is requested that the following delegation be added to the current system of delegations as delegation number 381(2):-

**Legislative mandate**

*S 24 of NEMA*

**Description of power or function**

*To submit comment on proposed projects' -*

- (a) *basic assessment reports and environmental management programs, and where applicable the closure plans, submitted in terms of regulation 19 (Environmental Impact Assessment Regulations , 2014); and*
- (b) *scoping reports submitted in terms of regulation 21 and the environmental impact assessment reports and environmental management programs submitted in terms of regulation 23 (Environmental Impact Assessment Regulations , 2014),*

*as part of such a project's Environmental Impact Assessments undertaken in terms of NEMA.*

**Delegated to**

Manager: Spatial Planning Heritage & Environment.

The basis for the proposed delegation is found in the time frame prescribed by the relevant legislation, being 30 days for submitting comments, which makes it impractical to refer participation by the Municipality to a Section 80 committee of Council to drive the process to conclusion within the time frame.

**4. LEGAL DEPARTMENT**

The Item and recommendations are supported.

**5. FINANCIAL IMPLICATION**

No financial implications.

**RECOMMENDED**

- (a) that the System of Delegations of Council be amended to include the provisions as set out below:

Legislative mandate: *S 24 of NEMA*

*To submit comment on proposed projects' –*

- (i) *basic assessment reports and environmental management programs, and where applicable the closure plans, submitted in terms of regulation 19 (Environmental Impact Assessment Regulations , 2014); and*
- (ii) *scoping reports submitted in terms of regulation 21 and the environmental impact assessment reports and environmental management programs submitted in terms of regulation 23 (Environmental Impact Assessment Regulations , 2014),*

*as part of such a project's Environmental Impact Assessments undertaken in terms of NEMA.*

- (b) that Council delegate this function to the Manager: Spatial Planning Heritage & Environment; and
- (c) that Council approve the proposed delegation and it be added to the current System of Delegations.

**(DIRECTOR: PLANNING AND ECONOMIC  
DEVELOPMENT TO ACTION)**

**8.2 APPOINTMENT OF A BUILDING CONTROL OFFICER***File number* : 4/1/4/5 and 4/3/3/5*Report by* : Director: Planning & Economic Development*Compiled by* : Manager: Building Development*Delegated Authority* : Council***Strategic intent of item***

Preferred investment destination	<input type="checkbox"/>
Greenest municipality	<input type="checkbox"/>
Safest valley	<input checked="" type="checkbox"/>
Dignified Living	<input checked="" type="checkbox"/>
Good Governance	<input checked="" type="checkbox"/>

**1. PURPOSE OF REPORT**

To recommend to Council the appointment of an alternative Building Control Officer in terms of Section 5 of the National Building Regulations and Building Standards Act 103 of 1977 (NBRBSA).

Section 5 (1) of NBRBSA reads as follows: “a local authority shall appoint a person as Building Control Officer in order to exercise and perform the powers, duties or activities granted or assigned to a Building Control Officer by or under this Act”. In terms of Section 28(4) of the NBRBSA, a local authority cannot delegate the appointment of a Building Control Officer hence the matter is submitted to Council for a decision.

**2. BACKGROUND**

It is essential that the council appoint more persons as alternative or stand-in Building Control Officers who are qualified in terms of the National Building Regulations, to undertake the role and functions of the Building Control Officer in the absence of the appointed Building Control Officers. The Council appointed two Building Control Officers, Rodney Adams and Babalwa Nkonzo. Should Mr Adams or Mrs Nkonzo be sick or on leave during the same period, it will leave council without a Building Control Officer and therefore no building plan application can be finalized.

Mr Hylton Daniels was appointed as a Plans Examiner on 1 March 2016. It is now proposed that he be appointed as alternative Building Control Officer for Stellenbosch Municipality with effect from 01 July 2016 and that this appointment be made only to allow Mr Daniels to act in the absence of the permanently appointed Building Control Officers, Mr Rodney Adams and Ms Babalwa Nkonzo. An acting allowance should be paid to Mr Daniels in accordance with the prescriptions of the pre-determined policy for acting periods.

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Mr Daniels holds a National Diploma in Architectural Technology from the Cape Peninsula University of Technology, obtained in 2006. His credentials, Identification Document and Driver's license are attached to this report as **APPENDICES 1, 2 and 3.**

**3. DISCUSSION**

A Building Control Officer shall:

- (a) make recommendations to the Local Authority in question, regarding any plans, specifications, documents and information submitted to such Local Authority in accordance with Section 4 (3);
- (b) ensure that any instruction given terms of this Act by the Local Authority in question, be carried out;
- (c) inspect the erection of a building and any activities or matters connected therewith, in respect of which approval referred to in Section 4(1) was granted;
- (d) report to the Local Authority in question, regarding non-compliance with any conditions on which approval referred to in Section 4(1) was granted; and
- (e) the Building Control Officer shall include a report from the Chief Fire Officer in his/her recommendation.

**4. COMMENTS BY DEPARTMENTS**

No comments were required from other Departments.

**5. CONCLUSION**

As the appointment of a Building Control Officer by Council is a statutory requirement in terms of the NBRBSA, Council is required to appoint a Building Control Officer, provided the candidate meets the minimum requirements stated in regulation A16 of the NBRBSA.

**6. APPENDICES**

Appendix 1: National Diploma in Architectural Technology  
Appendix 2: Identification Document (Hylton Brandon Daniels)  
Appendix 3: Driver's license (HB Daniels)

**RECOMMENDED**

- (a) that Mr Hylton Daniels be appointed as alternative Building Control Officer for Stellenbosch Municipality with effect from 01 July 2016;
- (b) that this appointment be only to allow the above-mentioned official to act in the absence of the permanently appointed BCO's (Mr Rodney Adams and Ms Babalwa Nkonzo); and
- (c) that an acting allowance be paid to this official in accordance with pre-determined policy for acting periods.

# APPENDIX 1



Cape Peninsula  
University of Technology

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TRUE COPY OF THE ORIGINAL DOCUMENT  
AND THAT THERE IS NO INDICATION THAT  
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BY AN UNAUTHORISED PERSON"

Name: Torricio Rank: Teller  
Signature: [Signature] Date: 10 SEP 2013

FOLIO 2  
DIE BOORD 7613

THE  
NATIONAL DIPLOMA

ARCHITECTURAL TECHNOLOGY

is awarded to

**DANIELS, HYLTON BRANDON**

student number

**199080321**

with effect from

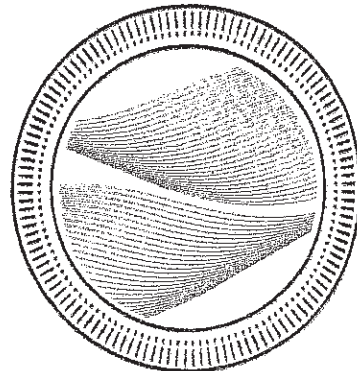
**01 DECEMBER 2006**

[Signature]

Registrar

[Signature]

Vice-Chancellor



# APPENDIX 2



**DAN**  
**COO**

GEREGISTREERDE WOON- EN POSTADRES

GEREGISTREERDE WOON- EN POSTADRES

Indien u hierdie verskrikke Fel. of indien besonderheids van u huidige adres of u naam verander, moet u 'n KENNEDING VAN ADRESVERANDERING, wat in 'n sake afdel. die oorspronklike dokument is gebruik word om die verandering te maak. Hierdie Fel. moet by of gelees word aan die regter afdel. van die DEPARTEMENT VAN BINNE- EN SEKERHEID.


REGISTERED RESIDENTIAL AND POSTAL ADDRESS

REGISTERED RESIDENTIAL AND POSTAL ADDRESS

If you have changed your address or if particulars of your present address, e.g. name, surname and/or street number, etc., have been changed, then a CHANGE OF ADDRESS form in the prescribed form must be used to report the change. This form should be handed in at or posted to the nearest regional office of the DEPARTMENT OF HOME AFFAIRS.

1

I.D.No. 791206 5018 08 6




S.A. BURGER/S. A. CITIZEN

VAN/ SURNAME  
**DANIELS**

VOORNAME/ FORENAMES  
**HYLTON BRANDON**

GEBOORTEDISTRIK OF LAND/  
DISTRICT OR COUNTRY OF BIRTH  
**SOUTH AFRICA**

GEBOORTEDATUM/  
DATE OF BIRTH  
**1979-12-06**



DATUM UITGEREIK/  
DATE ISSUED  
**1997-10-06**

UITGEREIK OP BESAG VAN DIE  
DIRKTEUR-GENERAAL  
SINNELANGSE SAKE

ISSUED BY AUTHORITY OF THE  
DIRECTOR GENERAL  
HOME AFFAIRS

# APPENDIX 3



**8.3 PROGRESS REPORT: ELECTRICAL SERVICES MASTER PLAN**

*File number* : 8/1/Engineering Services

*Report by* : Acting Director: Engineering Services

*Compiled by* : Acting Manager: Electrical Services

*Delegated Authority* : Council

**Strategic intent of item**

Preferred investment destination	<input checked="" type="checkbox"/>
Greenest municipality	<input checked="" type="checkbox"/>
Safest valley	<input checked="" type="checkbox"/>
Dignified Living	<input checked="" type="checkbox"/>
Good Governance	<input checked="" type="checkbox"/>

**1. PURPOSE OF REPORT**

To present the Electricity Master-plan to Council for adoption.

**2. BACKGROUND**

Council at its 33<sup>rd</sup> meeting held on 25 August 2015 resolved that:

*“that this matter be referred back to allow the Administration to submit a Progress Report to Council as mentioned in the item”.*

Although the previous Master-plan was done with a 20 year view, it has become outdated, because of unforeseen changes and as time goes on. The consultant therefore has to be reviewed every 6 years. The service provider, Royal Haskoning was therefore appointed for the update of Electricity Master-plan.

**3. DISCUSSION**

Information was sourced from the existing electrical network. The future development plans for the Municipality and future trends were also taken in consideration during the compilation of the plan.

The consultants made proposals for upgrades and future extension improvements that need to be done to ensure sufficient capacity, stability and quality of supply. Provisional cost estimates are included for each project.

A positive aspect is that there is no immediate crisis which means that the Electricity Department performed well looking after the system and the required planning and upgrades.

However there are challenges for the future to keep the Electrical network in a healthy state. The plan will guide the department for the

---

next few years to plan and budget. Due to the projected inaccuracies that escalate over time, the Stellenbosch Electricity Masterplan will have to be reviewed within 6 years.

Copies of the plan are available in electronic format from the Manager: Electrical Services' office.

**RECOMMENDED**

that Council adopts the Master-plan for the Electrical distribution system and that it be used and implemented by the Electricity Department.

**(ACTING DIRECTOR: ENGINEERING  
SERVICES TO ACTION)**

**ENGINEERING SERVICES AND HUMAN SETTLEMENTS COMMITTEE  
MEETING: 2016-02-03: ITEM 5.1.2****RECOMMENDED**

that Council adopts the Master Plan for the Electrical distribution system and that it be used and implemented by the Electricity Department.

**(ACTING DIRECTOR: ENGINEERING  
SERVICES TO ACTION)**

**MAYORAL COMMITTEE MEETING: 2016-02-17: ITEM 5.1.4****RECOMMENDED BY THE EXECUTIVE MAYOR**

that Council adopts the Master Plan for the Electrical distribution system and that it be used and implemented by the Electricity Department.

**(ACTING DIRECTOR: ENGINEERING  
SERVICES TO ACTION)**

**38<sup>TH</sup> COUNCIL MEETING: 2016-02-24: ITEM 7.3**

The Speaker **RULED**

- (a) that this matter be referred back to allow the Administration to arrange a workshop for Councillors before the end of March to discuss the item; and

- 
- (b) that the Administration provide the appendix in readable print whereafter same be resubmitted at the next meeting of Council scheduled for 2016-03-30.

**(ACTING DIRECTOR: ENGINEERING SERVICES TO ACTION)**

**FURTHER COMMENTS BY THE ACTING DIRECTOR: ENGINEERING SERVICES**

Subsequent to the Ruling of the Speaker in (a) above, the Workshop is scheduled for the last week in March 2016.

With reference to Ruling (b) above, the Master Plan is hereby resubmitted in a readable format as **APPENDIX 1 (DISTRIBUTED UNDER SEPARATE COVER)**.

**FOR CONSIDERATION**

**(ACTING DIRECTOR: ENGINEERING SERVICES TO ACTION)**

**39<sup>TH</sup> COUNCIL MEETING: 2016-03-30: ITEM 7.9**

**RESOLVED** (nem con)

that this matter be referred to the Council meeting scheduled for April 2016, to allow the Administration to arrange a Workshop prior to the Council meeting.

**(ACTING DIRECTOR: ENGINEERING SERVICES TO ACTION)**

**KINDLY NOTE: COUNCILLORS ARE REQUESTED TO BRING ALONG THE A3 PRINTOUTS (APPENDIX 1) DISTRIBUTED AT THE MEETING OF 2016-03-30, AS SAME WILL NOT BE PRINTED AND DISTRIBUTED AGAIN.**

**FURTHER COMMENTS FROM THE DIRECTOR: ENGINEERING SERVICES**

The workshop was presented to Councillors on 12 April 2016 in the Council Chambers by the Consultant, responsible for the compilation of the Electrical Master Plan.

**RECOMMENDED**

- (a) that Council take note of the workshop that was held on 12 April 2016; and
- (b) that Council adopts the Electrical Services Master Plan.

**(ACTING DIRECTOR: ENGINEERING SERVICES TO ACTION)**

# APPENDIX 1



# Report :- Electrical Infrastructure Master Plan

Revision 0  
June 2015

Stellenbosch Municipality

Contract No. : B/SM 50/14

Order No. : PO0295678

Project Title : Electrical Infrastructure Master Plan

Project No. : I01.CPT.000152





## ROYAL HASKONINGDHV DOCUMENT APPROVAL

DESCRIPTION	NAME	SIGNED	DATE
Project Manager	S W REID		26.06.2015

Contributors:

Beukes Kotze – Masterplan

Gideon Henning – Condition assesment

James Niemann, John King, Busisiswe Paliso, Apiwe Zweni – Data collectors

## ROYAL HASKONINGDHV REVISION CONTROL

0	26/06/2015	First issue
<b>REV</b>	<b>DATE</b>	<b>DESCRIPTION OF CHANGES</b>

## EXECUTIVE SUMMARY

Royal HaskoningDHV (Pty) Ltd was appointed as a consultant to Stellenbosch Municipality to assess the electrical infrastructure and prepare a 20 year master plan for the Municipality (order no. PO295678).

RHDHV have identified that the electrical network is currently constrained by firm transformer capacity at Jan Marais Substation. Unless electricity demand slows considerably, firm transformer capacity will be exceeded at Stellenbosch Main Substation within the study horizon.

Growth in electricity demand is likely to continue at 3 % and 4 % per annum for Stellenbosch and Franschhoek respectively resulting in the demand increasing from approximately 75 and 9 MVA to 140 and 20 MVA respectively over the 20-year forecast period. High growth and low growth scenarios in Stellenbosch provide a range of approximately 97 MVA to 157 MVA in 2034. This growth is largely attributable to residential property developments with notable development of land for industrial or commercial purposes.

This growth in electricity demand results in the recommendation to commission a new, Kayamandi HV/MV substation. The location of this substation leverages full benefit from the proximity to the 66 kV rural OHL. Strengthening of the MV network in the north will alleviate the pressure on the Cloeteville and University Substations, as well as the Stellenbosch internal 66 kV cabled network. To achieve firm transformation capacity upgrades are proposed for Jan Marais and Stellenbosch Main, and depending on load growth at Cloeteville, Golf Club and Franschhoek Substations. The future network has been thoroughly simulated and provides N-1 redundancy and acceptable voltage regulation under peak loading conditions.

The overall condition of the existing electrical infrastructure appears good given the age of the equipment installed. RHDHV recommends the planned replacement of older power transformers approaching 40 years and the continuation of current efforts to upgrade obsolete, oil-filled switchgear at distribution substations. A few smaller but equally important items have been identified for a number of substations. These have been presented for information and inclusion in separate maintenance plans or projects (as they fall outside the scope of the master plan itself).

Project schedules have been prepared for the network development projects. These aim to assist the Municipality in preparing for and planning the timeously catering of the forecast load growth. The timing of the projects is driven by the load forecast and may require slight adaptation in years to come as the forecast error is likely to increase when unforeseen external factors and influences arise. The resulting impact of any forecast error will materialise primarily in the timing of the network expansion. The recommendations (i.e. projects) will still be valid but may need to be delayed or brought forward based on the timing of actual future demand.

A provisional cost estimate for each project has been included in the report. Total costs for the twenty year period are in the region of R184 - R119 million in 2015 monetary terms. Depending on available funding it may be necessary to adjust the network development schedules.

The Municipality has a robust electrical network and the implementation of the recommended development plans will build on this foundation to ensure an even more reliable and dependable electricity supply in support of the Municipality's socio-economic objectives and to the benefit of the South African economy as a whole.

**NOTICE**

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## LIST OF ACRONYMS AND ABBREVIATIONS

ac	Alternating Current
ACSR	Aluminium Conductor Steel Reinforced
AIS	Air-insulated Switchgear
BTU	Battery Tripping Unit
CBD	Central Business District (refers to the centre of town)
FTSE	Financial Times and Stock Exchange
HG	High growth scenario
HV	High Voltage (refers to the 66 kV network)
kV	kilo Volt
kVA	kilo Volt Ampere
LG	Low growth scenario
MD	Maximum Demand
MV	Medium Voltage (refers to the 11 kV network)
MVA	Mega Volt Ampere
N-1	Refers to a redundancy scenario where the capacity is calculated as the total sum of the individual units less the largest single unit (i.e. the worst case scenario considering only a single failure). Sometimes referred to as the <i>contingency</i> or <i>firm capacity</i> .
NMD	Notified Maximum Demand
OEM	Original Equipment Manufacturer
OHL	Overhead Line / Overhead Power Line
p.a.	per annum
PoS	Point of supply
pu	per unit
R <sup>2</sup>	Coefficient of Determination
RG	Most-likely growth scenario (realistic growth)
RHDHV	Royal HaskoningDHV (the “Consultant”)
SF <sub>6</sub>	Sulphur Hexafluoride
Sub	Substation
SWBD	Switchboard
TRN	Transformer
Tx	Transformer

## 1. INTRODUCTION

Stellenbosch Municipality appointed Royal HaskoningDHV for professional services, under contract no. B/SM 50/14 - PO295678, to prepare a 20 year electrical infrastructure master plan for the Municipality.

The primary purpose of the study is to provide the Municipality with a long-term plan for the development and renewal of their electrical infrastructure.

The scope of professional services included:

- Data collection and visual inspection of all substations forming a part of the study as part of a condition assessment of the existing infrastructure.
- Preparation of a suitable load forecast with low growth, most-likely growth<sup>1</sup>, and high growth scenarios. The load forecast is based on town planning information, historic load growth, and information available for the existing electrical network.
- A load flow study utilising DlgSILENT PowerFactory® electrical simulation software. The study assessed the capacity and loading of the electrical infrastructure.
- Master planning based on the load flow study and condition assessment of existing infrastructure. The plan is prepared for the low growth, most-likely growth and high growth scenarios aligning with the load forecast. The study presents the “as-is” situation with a 20-year network development plan and associated project implementation timelines.
- The preparation of provisional cost estimates based on the recommendations included in the master plan.

The master plan covers the 66 kV and portions of the 11 kV network. The 11 kV network study includes all 11 kV substations that receive a direct inter-connection from another 11 kV substation<sup>2</sup>.

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<sup>1</sup> The most-likely growth scenario is abbreviated “RG” (realistic growth) for use as a column header in the summary tables presented later in this report.

The study is based on, and therefore also limited by, information available from the Municipality.

The study area is shown Figure 1-1 (for further details refer to Appendix A).

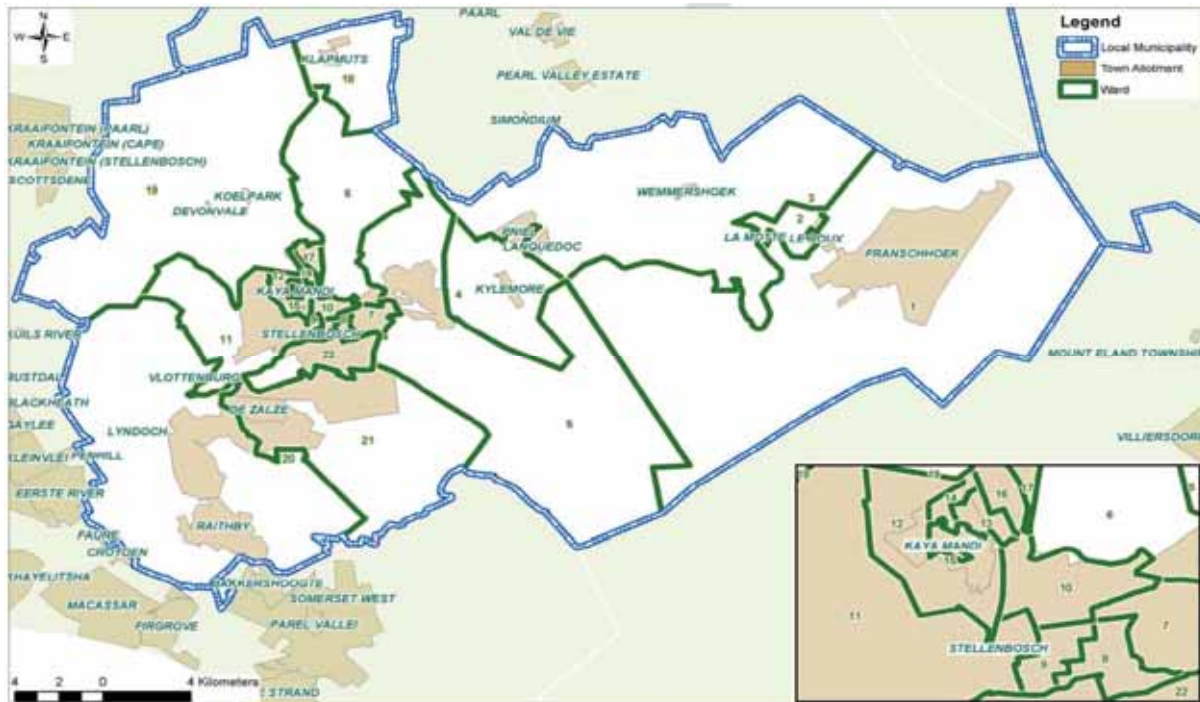


Figure 1-1 : Stellenbosch Municipal Boundary (Study Area)

This report will start with a presentation of the load forecast for the respective geographical areas and substations and provide the basis for the load growth scenarios. This is followed by a brief condition assessment of existing infrastructure and then details of the load flow study and associated results. Network development projects are then explained, which cater for the 2034 low growth, most-likely growth and high growth scenarios. Thereafter a provisional cost estimate of the proposed developments will be presented and the scheduling of the projects discussed. The report will end with a summary conclusion and consolidated recommendations for the Municipality to consider.

<sup>2</sup> Stated differently, all interconnections between 11 kV substations which deliver power to other consumers between the substations are excluded. Such interconnections are normally operated with an open point and are used to provide flexibility at the distribution level.

## 2. LOAD FORECAST

### 2.1 Historic Network Loading and Demand Growth

#### 2.1.1 Historic Loading

The Municipality currently has various supply points from Eskom. For the purposes of this study the supply points are divided in three categories:

1. Main supply points. These supplies are typically at 66kV and include Municipal transformation substations, primary 11kV network and switching substations. Strategic municipal planning is required for this category to plan bulk supply upgrades timeously to ensure that growth is maintained.
2. Secondary supply points. These supplies are at 11kV and feed interconnecting Miniature substations in smaller towns. Strategic inputs need to be issued to Eskom to enable for inclusion in their long term planning.
3. Rural feeds. Limited number of MV/LV transformers with no information regarding future developments.

The next table indicates the type of assessment which was completed per supply point category.

Table 2-1 : Assessment per supply point category

Category	Eskom Supply points	Load forecast	Network analysis
1 (Main)	Stellenbosch Main Substation Cloetesville Substation Franschhoek Substation	Yes	Yes
2 (Secondary)	Kylemore Substation Klapmuts Substation Jamestown Substation	Yes	No
3 (Rural)	Areas including: Raithby La Motte Etc.	No	No

The completed assessment aims to generate the required planning outputs for each category.

Figure 2-1 shows the maximum demand as recorded for each point of supply for the 12 months ending July 2014. It is important to note the following:

- The Municipality has a Summer load peak each year.
- Distell which represents 7% of the maximum demand, has a seasonal peak from January to March.
- Figure 2.1 represents the sum of the Cloeteville and Stellenbosch incoming supply.

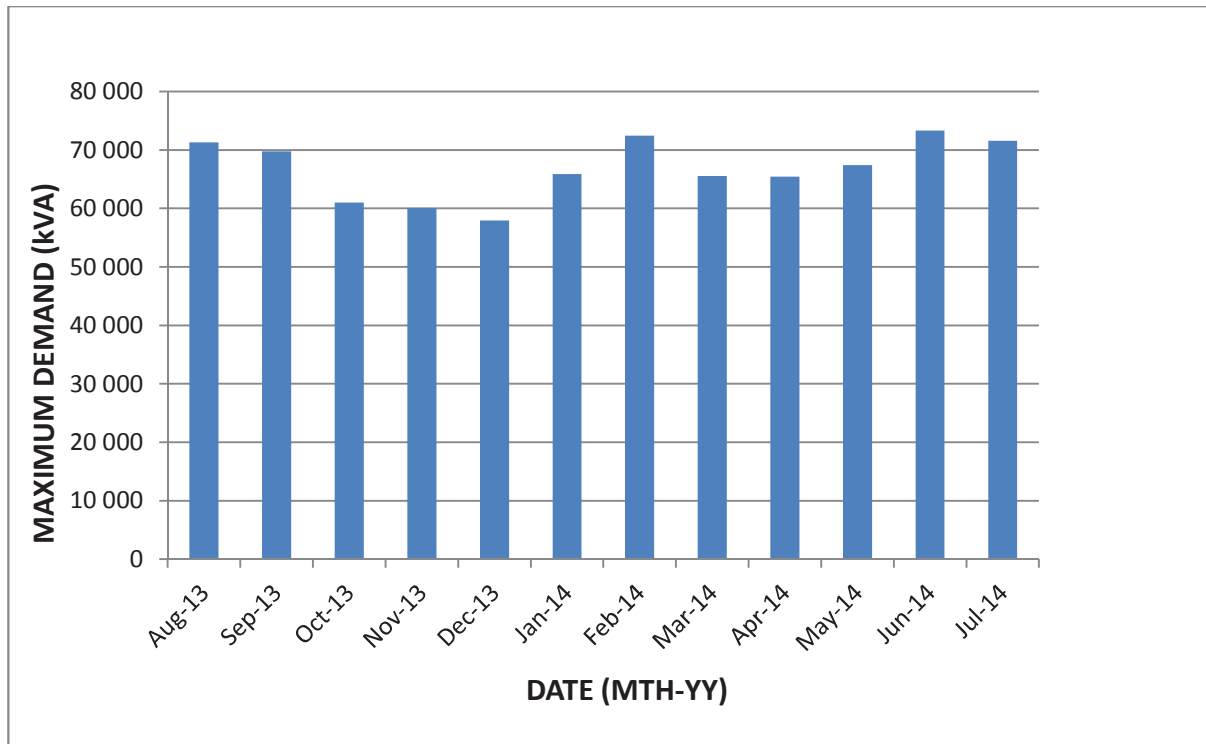


Figure 2-1 : Stellenbosch Maximum Demand (12 Months to July 2014)

Source: Eskom account information as summarised by Stellenbosch Municipality in a consolidated, Microsoft Excel Spreadsheet.

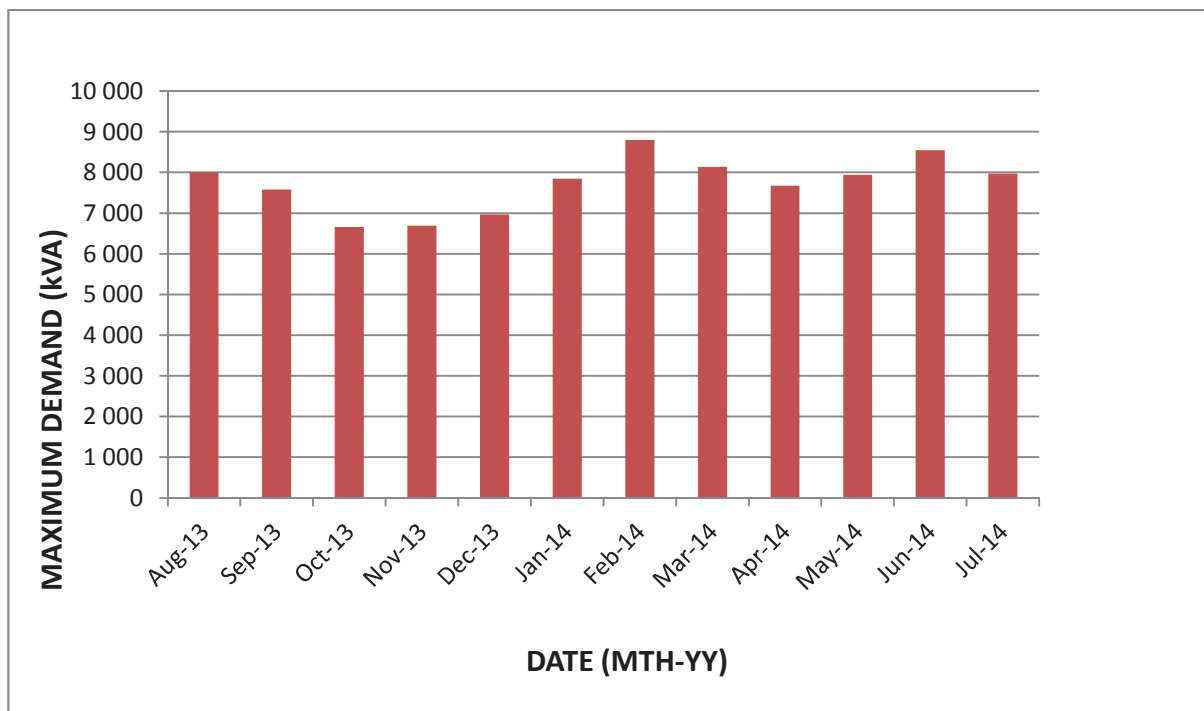


Figure 2-2 : Franschhoek Maximum Demand (12 Months to July 2014)

Source: Eskom account information as summarised by Stellenbosch Municipality in a consolidated, Microsoft Excel Spreadsheet.

Metering data was available from the Municipality for 2005 and the period December 2008 to July 2014.

The peak maximum demand is of particular interest as electrical infrastructure needs to be rated to cater for these demand peaks<sup>3</sup>. Therefore, peak maximum demand per calendar year was extracted from the metering data for closer analysis (i.e. ten data points).

The averaged maximum demand<sup>4</sup> is of interest to assess the growth in demand without the co-incident peaks that skew the maximum demand curve.

Figure 2.3 presents the resulting data set graphically for Stellenbosch while Figure 2.4 presents the resulting data for Franschhoek.

<sup>3</sup> "Demand peaks" in this instance refers to the maximum demand, which is "the highest averaged demand measured in kVA or kW during any integrating period within the designated billing period" (Eskom, 2012). "Note: the integrating period is normally 30 minutes and the designated billing period refers to all time periods" (Eskom, 2012).

<sup>4</sup> Yearly average of monthly maximum demand.

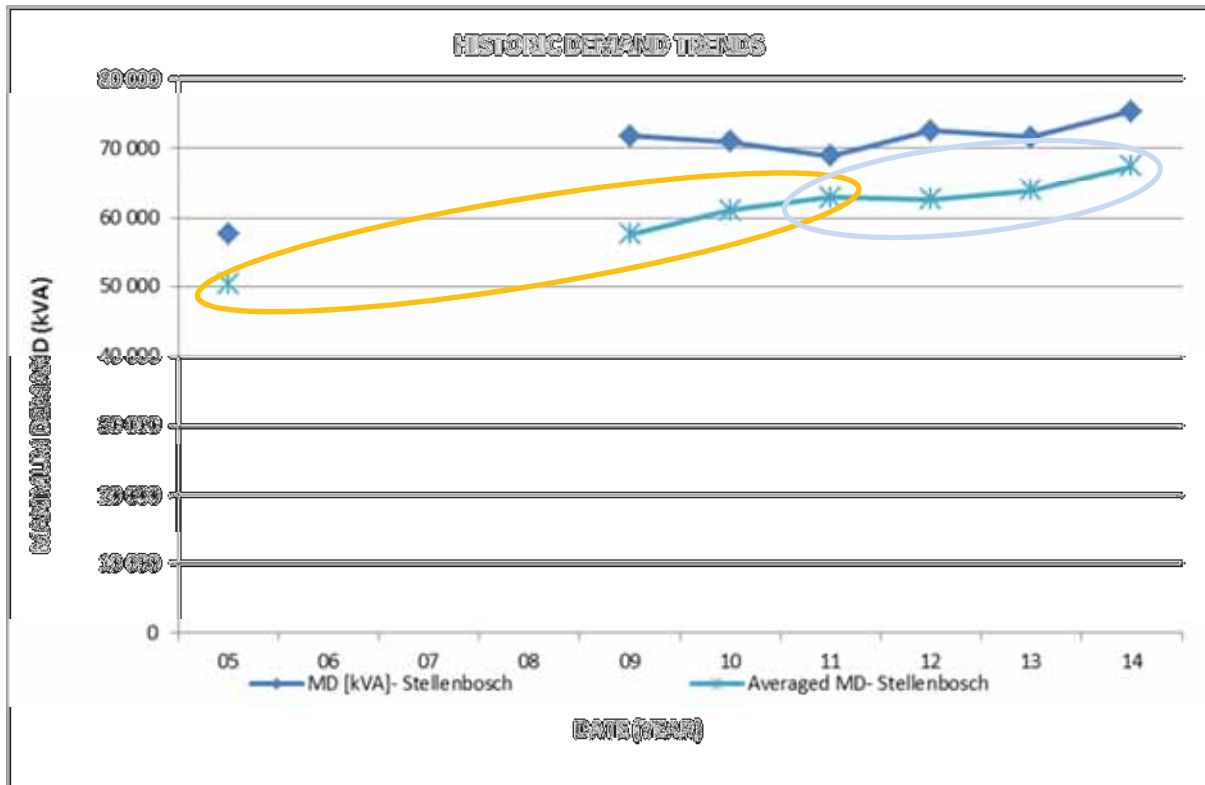


Figure 2-3 : Maximum Demand (per year) Stellenbosch

Table 2-2 summarises the average annual percentage growth in maximum demand for the Municipality over different time periods. The percentage is calculated in a compounded manner. The green cells constitute the long term sustained growth that is used as the “most likely” growth. The colouring is indicated in Figure 2-3 and Figure 2-4. The orange and blue cells correspond to high growth and low growth periods respectively.

Table 2-2 : Growth percentages

% Growth (various)	Period	Stellenbosch		Franschhoek	
		Max MD	Avg MD	Max MD	Avg MD
	'05-09	5.58%	3.45%	6.83%	7.68%
	'05-14	2.98%	3.31%	4.15%	4.49%
	'05-11	3.00%	3.79%	7.24%	5.16%
	'11-14	2.96%	2.35%	-1.78%	1.06%
	'09-14			2.05%	2.00%

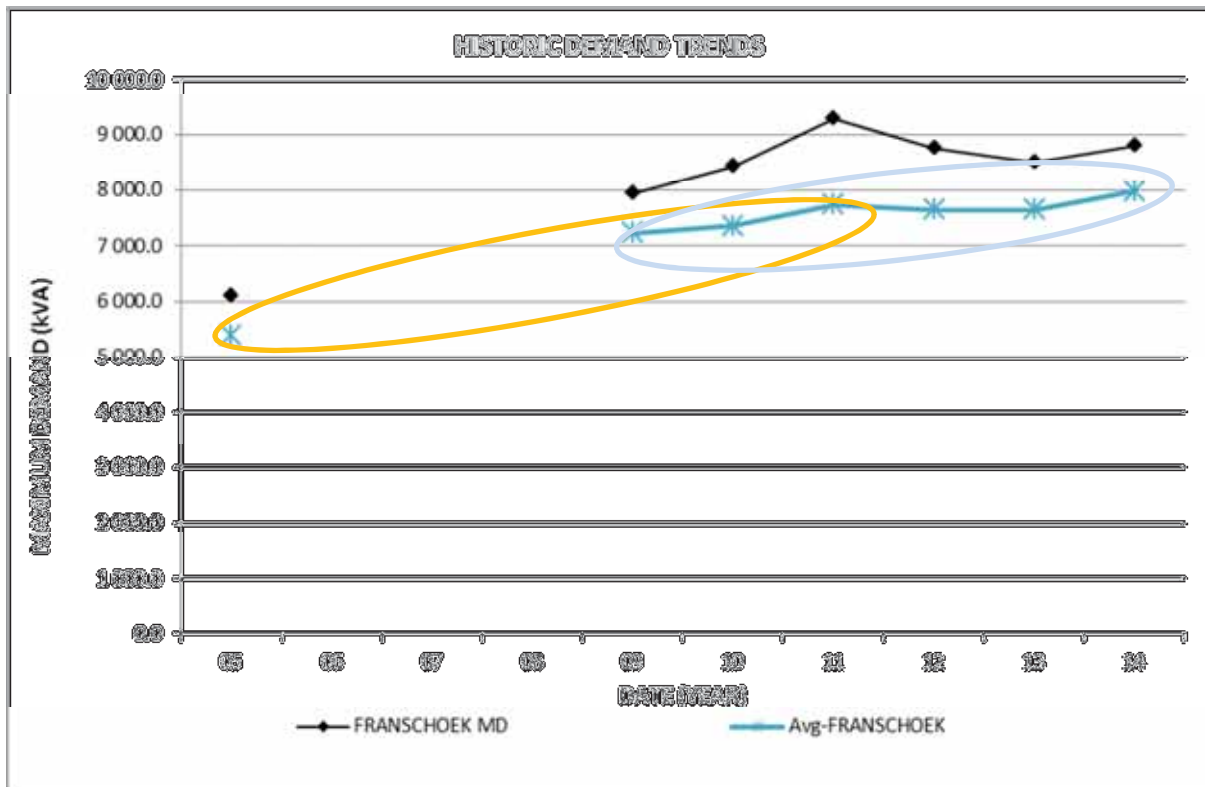


Figure 2-4 : Maximum Demand (per year) Franschhoek

## 2.2 Population Growth

The population of the Municipality for the past three years is shown in Figure 2-5 (Stellenbosch Municipality, 2014).



**POPULATION: STELLENBOSCH MUNICIPALITY**

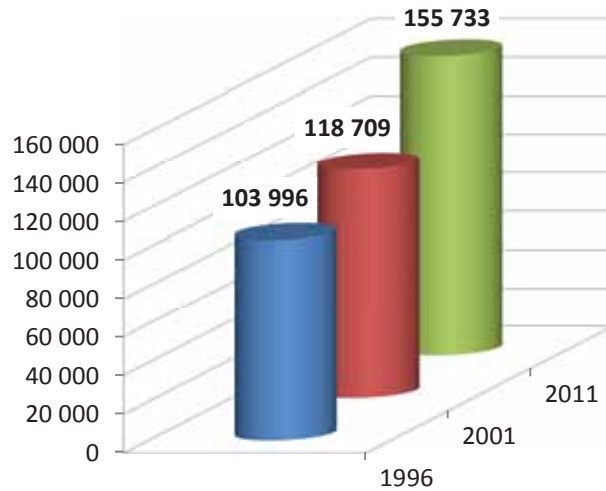


Figure 2-5 : Total Population

Figure 2-6 shows the population growth rates for the periods 1996-2001 and 2001-2011 as published by Statistics South Africa (Stellenbosch Municipality, 2014). StatsSA reports populations of 103 996, 118 709 and 155 733 for 1996, 2001, and 2011 respectively.

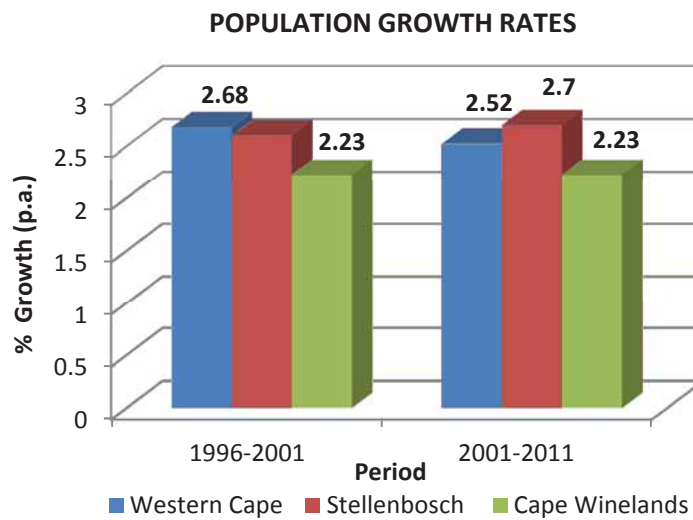


Figure 2-6 : Population Growth Rates

For the period 2001-2011, growth rates are on a par with the Western Cape and Cape Winelands region and significantly higher than the 1996-2001 period.

### **2.3 Progress with Electrification**

Access to electricity increased from 89.9 % in 1996 to 98.8 % in 2011 (Stellenbosch Municipality , 2014). Electrification projects are therefore a relatively small contributor to the load forecast when compared to housing projects.

### **2.4 Housing**

While the number of housing units were not available, the Municipality face a shortage of approximately 20 000 housing units (Stellenbosch Municipality , 2014).

In the context of the current shortage, it is likely that the provision of housing will remain a priority for the Municipality and the spatial development plan makes provision for this.

### **2.5 Future Development Plans**

A detailed list of the future developments and their associated loads is provided in Appendix B. This section provides an overview and reference should be made to the appendix for any further information.

The load associated with each planned residential development is assigned by the application of an after diversity maximum demand (ADMD). ADMD values that were used align with the SANS 507 recommendations (Standards South Africa, 2007). This is discussed further in Section 2.6.1. Commercial and industrial loads are estimated based on similar developments.

Figure 2-7 and Figure 2-8 shows the apportionment of the total future load into the development categories: residential, commercial and industrial, and for the purposes of Stellenbosch area, the loads related to University of Stellenbosch have been shown separately. The majority of the overall future load is associated with residential developments. This is reinforced when the Municipality's key economic activities are evaluated (Stellenbosch Municipality, 2014).

### LOAD APPORTIONMENT: STELLENBOSCH

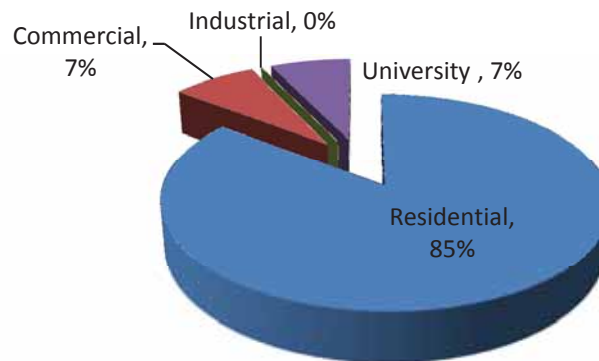


Figure 2-7 : Future Load Apportionment Stellenbosch

For the Stellenbosch area, the future loads, as indicated in Figure 2-7, the majority of which are residential. The remainder is split between the University of Stellenbosch and commercial loads.

## LOAD APPORTIONMENT: FRANSCHHOEK

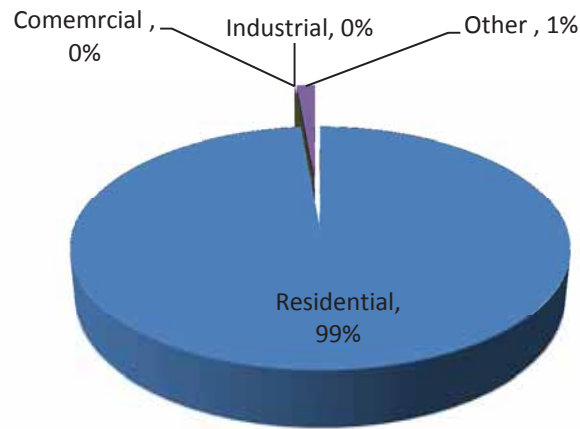


Figure 2-8 : Future Load Apportionment Franschhoek

For the Franschhoek area, the future loads, as indicated in Figure 2-8 are purely residential. The other 1% load made reference to in Figure 2-8 refers to two new library's and a sport centre planned for construction in the forecast period.

Three areas which have not been excluded from the power system model but do form part of the forecast area, are Dwarsrivier Valley, Klapmuts and Jamestown (Refer to Figure 2-9, Figure 2-10 and Figure 2-11). This is due to them being fed directly by Eskom.

### LOAD APPORTIONMENT: PNIEL, (DWARSRIVIER VALLEY)

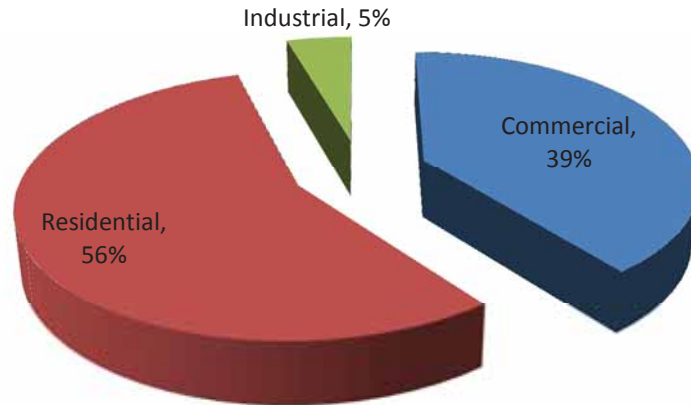


Figure 2-9 : Future Load Apportionment Dwarsrivier Valley, Pniel

The future load in the Dwarsrivier Valley (Figure 2-9) in contrast has a high level of commercial development planned, while still noting the majority being residential.

### LOAD APPORTIONMENT: KLAPMUTS

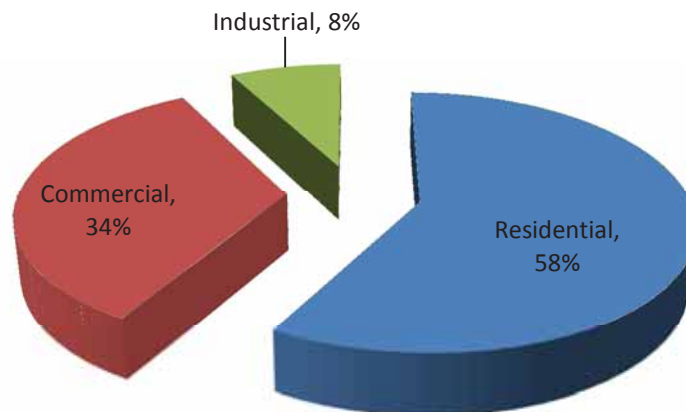


Figure 2-10 : Future Load Apportionment Klapmuts

Klapmuts, as indicated in Figure 2-10, reflects a mixed development forecast of commercial, industrial and residential with just over the majority being residential.

## LOAD APPORTIONMENT: JAMESTOWN

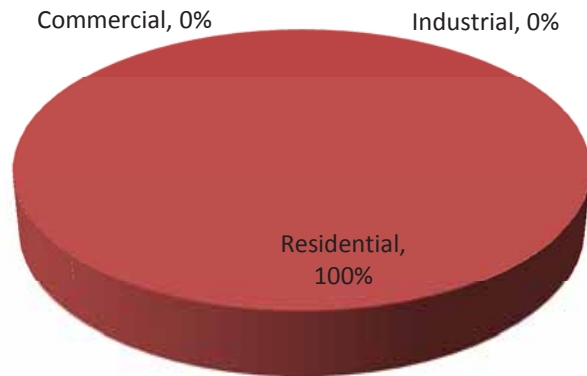


Figure 2-11 : Future Load Apportionment Jamestown

While Jamestown in contrast to Klapmuts, as shown in Figure 2-11, reflects a purely residential development forecast.

### 2.5.1 Housing

Substantial housing developments have been planned. There are 17 274 units planned in Stellenbosch alone, and 5 528 units planned in Franschhoek. Figure 2.10 to Figure 2.13 shows the number of units planned and the associated load for low, medium and high income housing.

### RESIDENTIAL UNITS

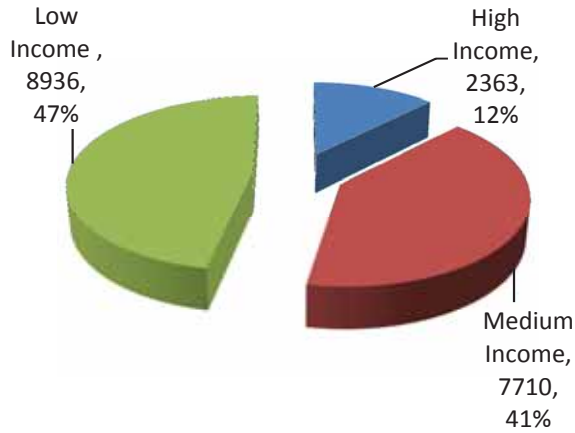


Figure 2-12 : Residential Units Stellenbosch

### RESIDENTIAL LOADS (kVA)

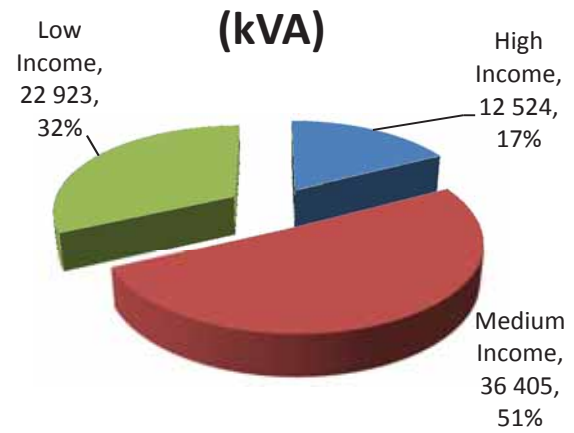


Figure 2-13 : Residential Loads Stellenbosch

The planned housing developments in Stellenbosch consists mostly of low and medium income housing units, as reflected in Figure 2-12 and Figure 2-13, with the majority of the electrical load being medium income housing.

### RESIDENTIAL UNITS

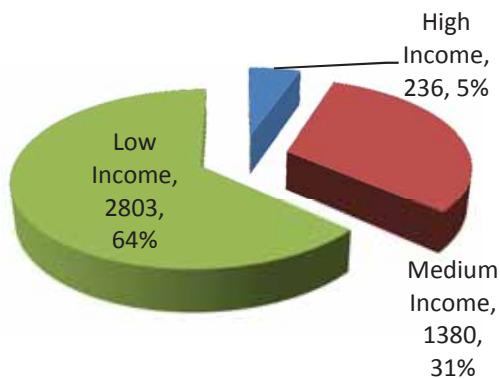


Figure 2-14 : Residential Units Franschhoek

### RESIDENTIAL LOADS (kVA)

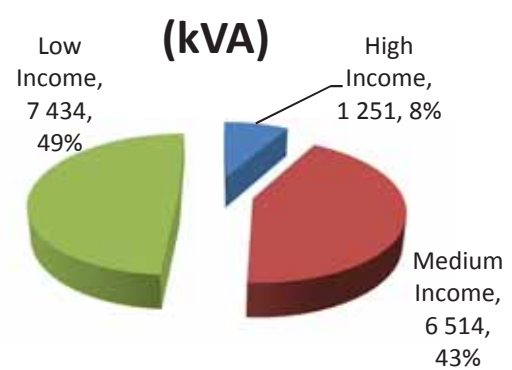


Figure 2-15 : Residential Loads Franschhoek

The planned housing developments in Franschhoek consists mostly of low income housing units, as reflected on Figure 2-14 and Figure 2-15, with the minority being high income housing.

Three areas which have not been excluded from the power system model but do form part of the forecast area, are Dwarsrivier Valley, Klappmuts and Jamestown (Refer to Figure 2-14 to Figure 2-21). This is due to them being fed directly by Eskom.

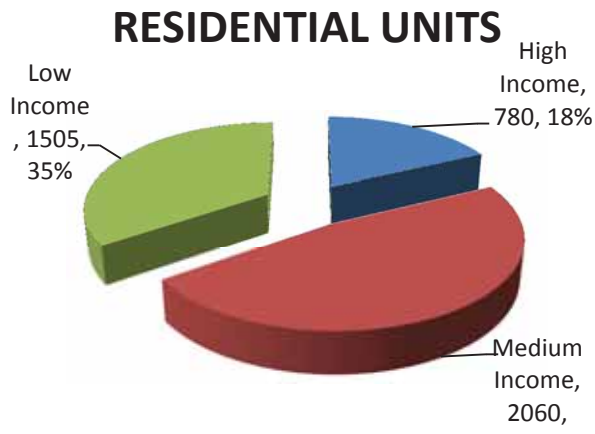


Figure 2-16 : Residential Units Dwarsrivier Valley, Pniel

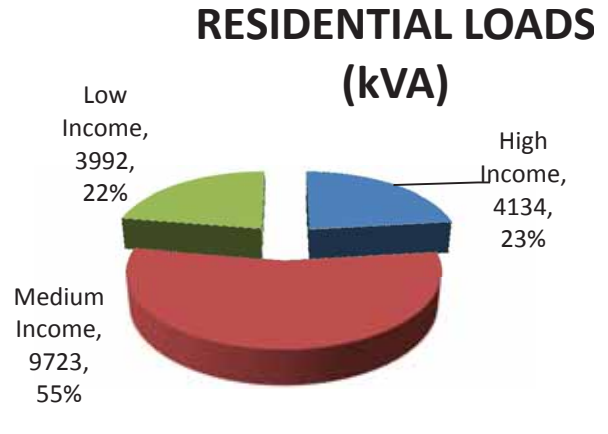


Figure 2-17 : Residential Loads Dwarsrivier Valley, Pniel

The planned housing developments in Dwarsrivier Valley differs from other areas such as Stellenbosch, as Dwarsrivier consists mostly of medium income housing units, as reflected in Figure 2-16 and Figure 2-17, with the remainder being low income and high income housing.

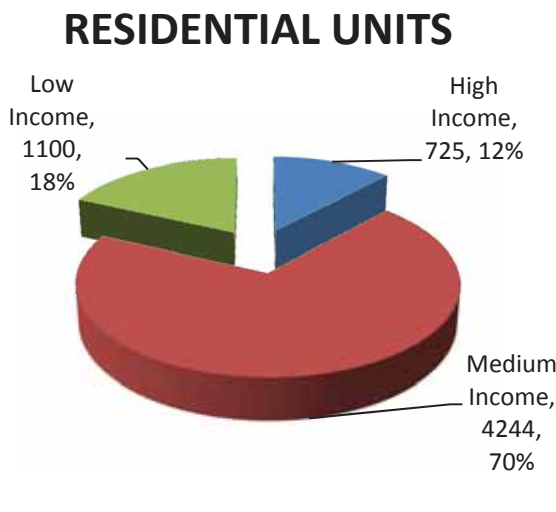


Figure 2-18 : Residential Units Klapmuts

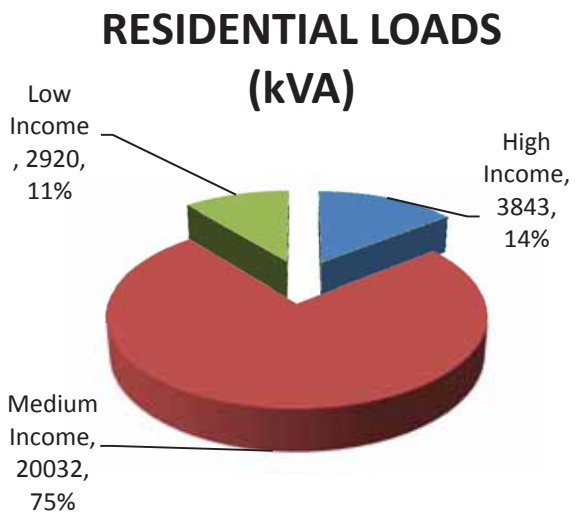


Figure 2-19 : Residential Loads Klapmuts

The planned housing developments in Klapmuts resemble Dwarsrivier Valley, as Klapmuts consists mostly of medium income housing units, as reflected in Figure 2-18 and Figure 2-19, with the remainder being low income and high income housing.



## RESIDENTIAL UNITS

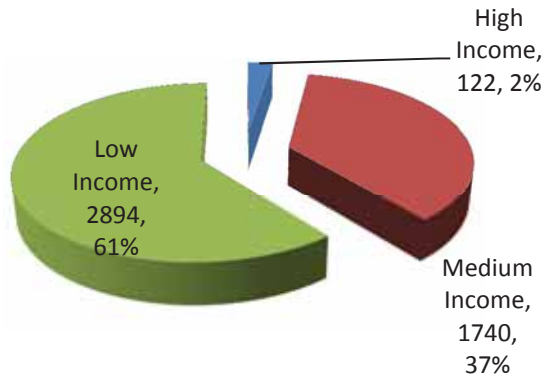


Figure 2-20 : Residential Units Jamestown

## RESIDENTIAL LOADS (kVA)

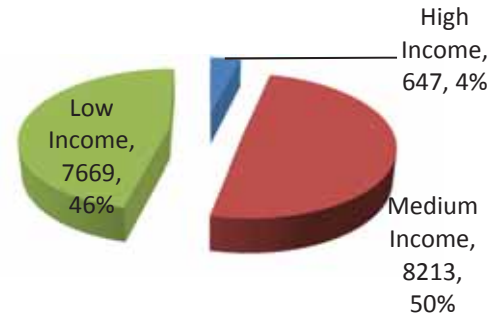


Figure 2-21 : Residential Loads Jamestown

The planned housing developments in Jamestown are mostly for low cost housing, as reflected in Figure 2-20 and Figure 2-21.

It should be noted that the weighting in terms of electrical load with respect to housing numbers does differ due to the electrical load of the higher income housing been calculated using higher ADMD figures.

The top five residential developments for Stellenbosch (in terms of electrical demand) per housing category are listed in Table 2-3.

It should be noted that the map reference used in the below tables, corresponds to the development details in Appendix B, and is derived from the water Master Plans, developed by the Water and Sanitation Department of Stellenbosch Municipality.

Table 2-3 : Top 5 Residential Developments per Category Stellenbosch

Stellenbosch		
Development Name	Units (No.)	Demand (kVA)
High Income		
S67-Single Residential Development	1 055	5 591
S57-Single Residential Development	715	3 789
S58-Single Residential Development	632	3 349
S55-Single Residential Development	613	3 248
S54-Single Residential Development	350	1 855
Medium Income		
S75-Single Residential Development	1 070	5 050
S20-Single Residential Development	736	3 473
S74-Single Residential Development	670	3 162
S19-Single Residential Development	386	1 821
S34-Single Residential Development	342	1 614
Low Income		
S15-Low Cost Housing	4 626	12 258
Kayamandi (Further housing)	133	352
S81-Low Cost Housing	910	2 411
S80-Low Cost Housing	649	1 719
S17-Low Cost Housing	537	1 423

The top five residential developments for Franschhoek (in terms of electrical demand) per housing category are listed in Table 2-4.

Table 2-4 : Top 5 Residential Developments per Category Franschhoek

Franschhoek		
Development Name	Units (No.)	Demand (kVA)
High Income		
FH22-Single Residential Development	172	911
Medium Income		
FH16-Single Residential Development	286	1 349
FH5-Single Residential Development	270	1 274
FH4-Single Residential Development	259	1 222
Low Income		
FH9-Affordable Housing	2 704	7 166
Langrug Informal Settlement	1 300	3 445
FH10.1-Affordable Housing	96	254
FH10.2-Affordable Housing	78	207
FH10.3-Affordable Housing	129	342

### 2.5.2 Commercial Developments

In terms of large commercial consumers, this is limited to the various sites in which Stellenbosch University operates in such as student residences and faculty premises. Their property services division provided their new forecast maximum demand figures for these sites as shown in the below table (Table 2-5).

Table 2-5 : University of Stellenbosch Sites Forecast ADMD

<b>USB Bulk Supply Points</b>	<b>Existing Nominated Max Demand (KVA)</b>	<b>New Nominated Max Demand (KVA)</b>
Biologie (JC Smuts)	1 000	1 500
BJ Voster (Lettere)	2 000	2 000
DF Malan (Schuman)	1 000	1 500
Erica	2 000	2 000
Helderberg	500	500
Ingenieurs	4 000	4 500
Instandhouding	1 000	2 000
Konservatorium	1 000	2 000
Monica	1 000	1 500
Neelsie (LSS)	4 000	5 000
Simonsberg	1 500	2 500
Welgevallen	1 000	2 000
Coetzenburg	1 000	3 000

It is unlikely that these will be the only commercial developments in the forecast period. Further developments are catered for in the respective forecast scenarios through planned land use plans by the Municipality.

### 2.5.3 Industrial

The largest industrial consumer for the Stellenbosch Electricity Department is the two Distell sites, being the Adam Tas and Berg Kelder sites. No major expansions are planned at either of these sites. They noted that they had undertaken a broad variety of energy saving measures to reduce their Maximum Demand but didn't expect any further reductions beyond 5%.

It is unlikely that these will be the only industrial developments in the forecast period. Further developments have been catered for in the respective forecast scenarios through planned land use plans by the Municipality.

## 2.6 Load Forecast

A load forecast has been prepared for the Municipality. The forecast is sufficiently detailed to inform the 10-year and 20-year network studies.

### 2.6.1 Methodology

The load forecasting methodology is briefly summarised in this section.

Historic energy-use data was collected primarily from the Eskom electricity accounts. A linear trend-line was added to the actual maximum demand data and used to establish the predicted demand at the onset of 2014 (the actual maximum demand for 2012 was below the trend-line forecast). This demand value is escalated on a compound growth basis per annum. The percentage growth applied is dependent on one of three scenarios: low growth, most-likely growth<sup>5</sup>, or high growth. These percentages are estimated based on all contributing factors (e.g. historic growth, population growth, spatial planning, integrated development plans, progress with housing, and municipal objectives/priorities).

The forecast scenarios are then compared to the growth associated with future developments within the Municipal boundaries as a “sensitivity” cross-check.

### 2.6.2 Scenarios

The historic growth rates as stated in Table 2-2 are tempered slightly, based on the information presented in the preceding sections and in the context of a 20-year forecast, to give the scenario growth rates used in the load forecast (Table 2-6).

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<sup>5</sup> Note that most-likely growth is abbreviated “RG” (realistic growth) in this report.

Table 2-6 : Growth scenario's

	<b>Stellenbosch</b>	<b>Franschhoek</b>
High Growth	3.5%	5.2%
Realistic Growth	3.0%	4.1%
Low Growth	2.5%	2.5%

The low growth scenario attempts to account for the transfer of reliance on electricity as renewable energy options become more affordable in the context of increasing electricity tariffs and incentives to contribute to energy generation (e.g. distributed generation and feed-in tariffs).

### 2.6.3 Future Development Forecast

The future development forecast follows from information presented in Section 2.5. The load associated with the residential developments was calculated as follows:

- Residential: use of an after-diversity maximum demand (kVA) per unit.
- Commercial: based on discussions with the Municipality and commercial property owners or developers.
- Industrial: based on discussions with factory owners and typical water treatment plant electrical demand for similar works (RHDHV provisional estimates).

The bulk of the future load is attributable to residential developments, which is therefore the key driver for the profile and magnitude of the forecast.

The number of units planned per year is based on information received from the Municipality. The Housing Department estimate 20-30 high housing units and 400-500 medium income housing units per year. The housing development plans provide for 800 low income units per year.

The number of units built per year has been based on these quantities.

It should be noted that while low income housing would be driven by Government/Provincial Funding, the medium and high income units would be driven by economic conditions (amongst others).

The residential housing load was estimated based with SANS 507 (Standards South Africa, 2007).

### 2.6.4 Stellenbosch Forecast

The resulting maximum demand forecast for the three scenarios and future developments is shown in Figure 2-22. The demand values associated with each scenario are carried forward into the network modelling and simulations for the 20-year (2034) network development plans.

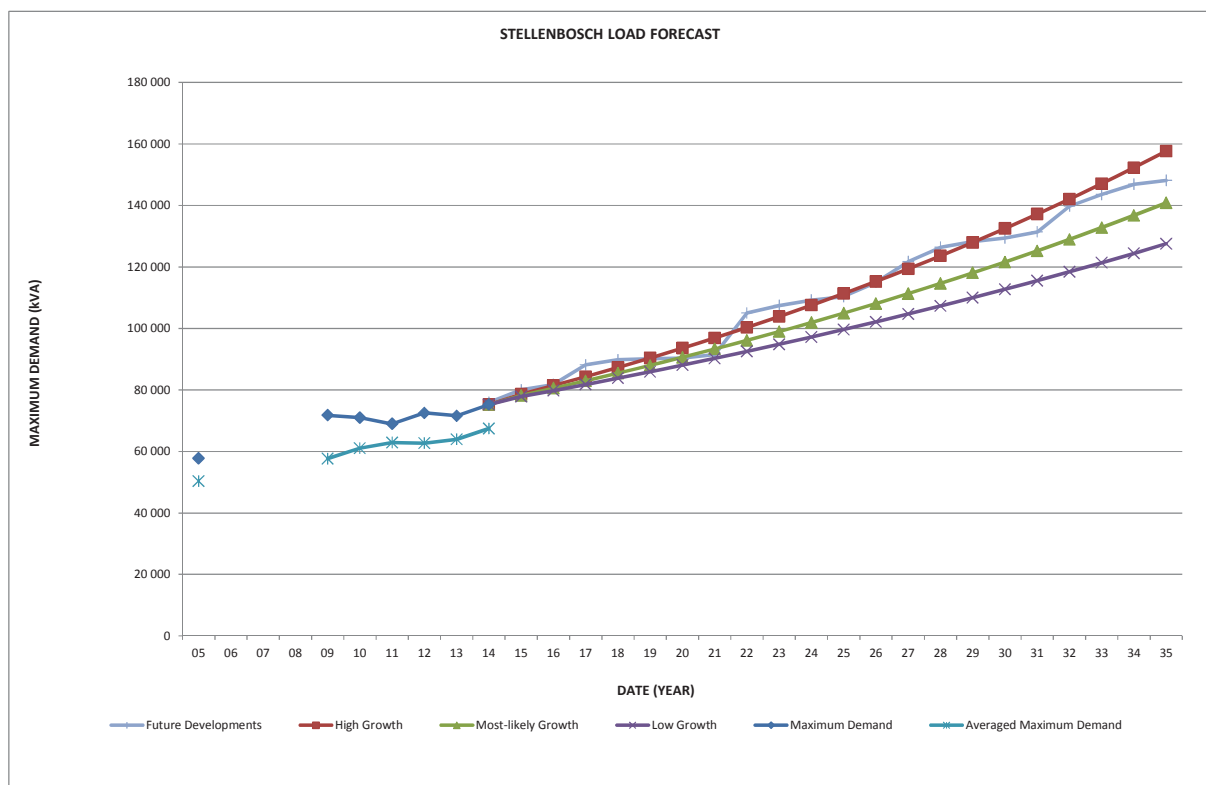


Figure 2-22 : Maximum Demand Forecast

The 20-year load associated with the future developments aligns with what is expected; that is, an optimistic development target falling within the band created by the high growth and

most-likely growth scenarios. For the high growth scenario the 20-year load is 157 MVA, more than double the current maximum demand of 75 MVA.

### 2.6.5 Franschoek Forecast

The resulting maximum demand forecast for the three scenarios and future developments is shown in Figure 2-23. The demand values associated with each scenario are carried forward into the network modelling and simulations for the 20-year (2034) network development plans.

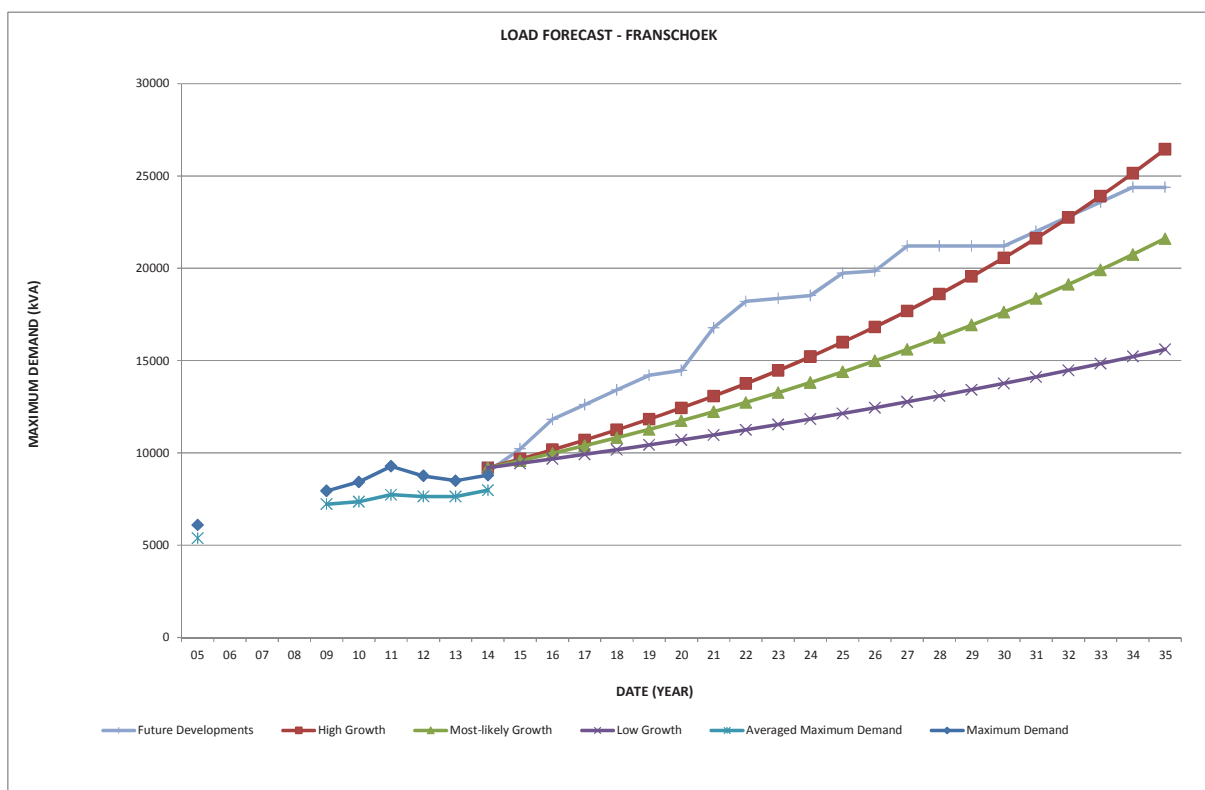


Figure 2-23 : Maximum Demand Forecast

The 20-year load associated with the future developments aligns with what is expected; that is, an optimistic development target falling within the band created by the high growth and most-likely growth scenarios. For the high growth scenario the 20-year load is 26 MVA, approximately than triple the current maximum demand of 9 MVA.

### 2.6.6 General Comments on the Load Forecast

The future development data was used to apportion the load growth, associated with the applicable scenario, to the secondary substations (11 kV) forming a part of the final distribution network (Section 2.7 explains the apportionment further). The effect of apportioning the load growth is that all developments in the future development forecast are assumed to develop at the same rate.

The timing of the network developments may be too late for that specific geographic area. The Electrical Department will need to be very diligent in corresponding with potential developers / other internal departments to ensure that adequate, local, capacity is available (timeously) in such cases.

The load forecast provides a view of likely growth for the purposes of the study. The load forecasting effort was based on information that was readily available from the Municipality within the project timelines and contributions received from the respective departments. As such the forecast has been prepared using primarily judgemental methods. The use of judgemental methods is considered most appropriate.

The forecast accuracy should be reasonably good for the first few years and will progressively decay as time progresses (i.e. become less accurate) and unforeseen external factors come to bear<sup>6</sup>. The low, most-likely and high growth scenarios aim to take account of this to a certain extent.

The resulting impact of forecast error will materialise primarily in the timing of network expansion. The recommendations will still be valid but they might need to be delayed or brought forward based on the timing of the actual future demand.

## 2.7 Substation Future Load for the Network Studies

The overall demand forecast, as presented in Figure 2-22 and Figure 2-23, provides a forecast of the total demand growth for the Municipality. For the purpose of the network studies, the demand growth needs to be apportioned between the respective geographic areas and ultimately to the nearest substation.

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<sup>6</sup> The same is true for all forecasts.



RHDHV used the future load forecast to achieve this. The future load forecast is linked to the Municipality's Potential Future Development Plans (as attached in Appendix A). As this information correlated well the high growth demand forecast and the Potential Future Developments were apportioned in the specific year and geographical location for analysis.

To affect the reduced growth in the most likely (realistic) and low growth all the loads were scaled down by an appropriate amount. This in effect assumes that each of the developments planned progresses at the same (slower) rate. If a single development receives a higher priority in the years ahead, the Electrical Department will need to carefully assess and confirm that adequate capacity is available, particularly in the local distribution network. To a certain extent this is unavoidable in long term master plans where development budgets and economic climate are uncertain.

Except for areas specifically identified for densification projects, the load in established areas is held constant for the purposes of the network studies. The assumption is that any increases will be offset by end-user energy conservation measures and distributed generation projects.

### **3. LOAD FLOW STUDY**

What will follow in this section is a discussion of the DigSilent Powerfactory model which was developed as well as the current status of the network.

#### **3.1 Basis of Load Flow Study**

The following list aims to capture the basis of the load flow modelling and the results of which are reported in subsequent sections of this report:

- The load flow modelling has been performed using DigSILENT PowerFactory® Version 15.2.2.
- The electrical reticulation was based on drawings provided by the Municipality ("single line diagram 07-22-14" received on 29 July 2014). The single line and site layout diagrams were confirmed during an extensive site condition assessment.

- Typical information that was gathered during the condition assessment was used for the modelling of transformers.
- The network model consists of the 66 kV cabled network, the primary 11kV network and critical 11kV interconnection cables. Critical 11kV interconnecting cables are defined to be all interconnecting cables larger than 35mm<sup>2</sup> with minimal loads on route. Loads were included at 11 kV at the location of the various main or switching substations.
- Cable size, construction and type were obtained from the single line diagrams and GIS data. Cable electrical properties were obtained from the online catalogues of Aberdare and African Cables.
- A transformer thermal rating of 1.0 pu was used (i.e. percentage ratings are expressed as a percentage of the rated current and do not account for any transformer loading practices of the Municipality).
- Only one level of network contingency has been considered (i.e. N-1 redundancy).
- Protection settings were not in the scope of the study and have not been considered. Protection settings might need to be adjusted as loading on the network changes.
- The voltage dependency of loads were not considered.
- Power factor of loads were simulated at 0.92 that is typical for municipal networks.
- Buried 11 kV cables were only de-rated for grouping, according to SANS 10198. The following factors were used: 0.89, 0.80 and 0.77 for two, three and four cables respectively, sharing a route. This is based on 300 mm spacing between cables.
- Metering data was extracted by Spectrum Communications specifically for this project. Data was received as currents per 11 kV feeder at 30minute intervals for the period February - March 2014 and June - July 2014.
- Diversity between individual switching substations and the HV network was calculated at 0.84, 0.94 and 0.88 pu for Stellenbosch, Cloetesville and Franschhoek respectively. This calculation was based on metered substation data.
- Tap changers were simulated on all 66/11 kV transformers, with a voltage setpoint of 1.085 pu and a maximum and minimum voltage of 1.10 and 1.07 pu respectively. These values are in accordance with SANS 507. Any voltage in the MV network lower than 1.055 pu will be treated as a voltage regulation exception. This corresponds to half of the permissive voltage drop of 3 % (0.03 pu) in the MV distribution network (also according to SANS 507).
- New 66kV substations to be based on outdoor, air insulated technology.

- New HV transformers to be 66/11 kV ONAN Dyn11, typically with 20MVA capacity.
- New 11kV switchgear to be metal clad, withdraw-able (behind closed doors), air insulated switchgear installed in brick built substation rooms.
- New HV cables to be XLPE single core, aluminium typically 300mm<sup>2</sup>. New main MV cables to be PILC three core, copper typically 185mm<sup>2</sup>.
- Bulk electrification networks for Stellenbosch town and Franschhoek were developed. The areas of Pniel, Kylemore, Lanquedoc, Klapmuts, Raithby, De Zalze and Jamestown are fed with bulk power directly from Eskom.
- A detailed fault level study when proposing upgrades was not conducted. It is assumed that obsolete switchgear will be upgraded along with significant network strengthening. Modern switchgear will typically have fault capacity in excess of 10kA (typical for 20MVA transformers). A comprehensive fault study is essential when compiling the detail design of substation upgrades.

### **3.2 General Discussion: Stellenbosch Existing Network**

Stellenbosch town receives bulk supply at Stellenbosch Main and Cloeteville substations at 66 and 11 kV respectively. The internal 66 kV network is supplied from Stellenbosch Main substation and feeds Markotter, University, Jan Marais and Golf Club Substations. This arrangement is indicated in drawing I01.CPT.000152/E20.

Also indicated in drawing I01.CPT.000152/E20 is critical interconnecting 11kV cables, these cables can assist in transferring loads between areas in case of equipment failure.

An Eskom rural 66 kV line that originates at Stellenbosch Main Substation passes Stellenbosch to the north (Figure 3-1). This line feeds large portions of the central area of the Stellenbosch municipality including the Cloeteville, Kylemore and Franschhoek Substations.

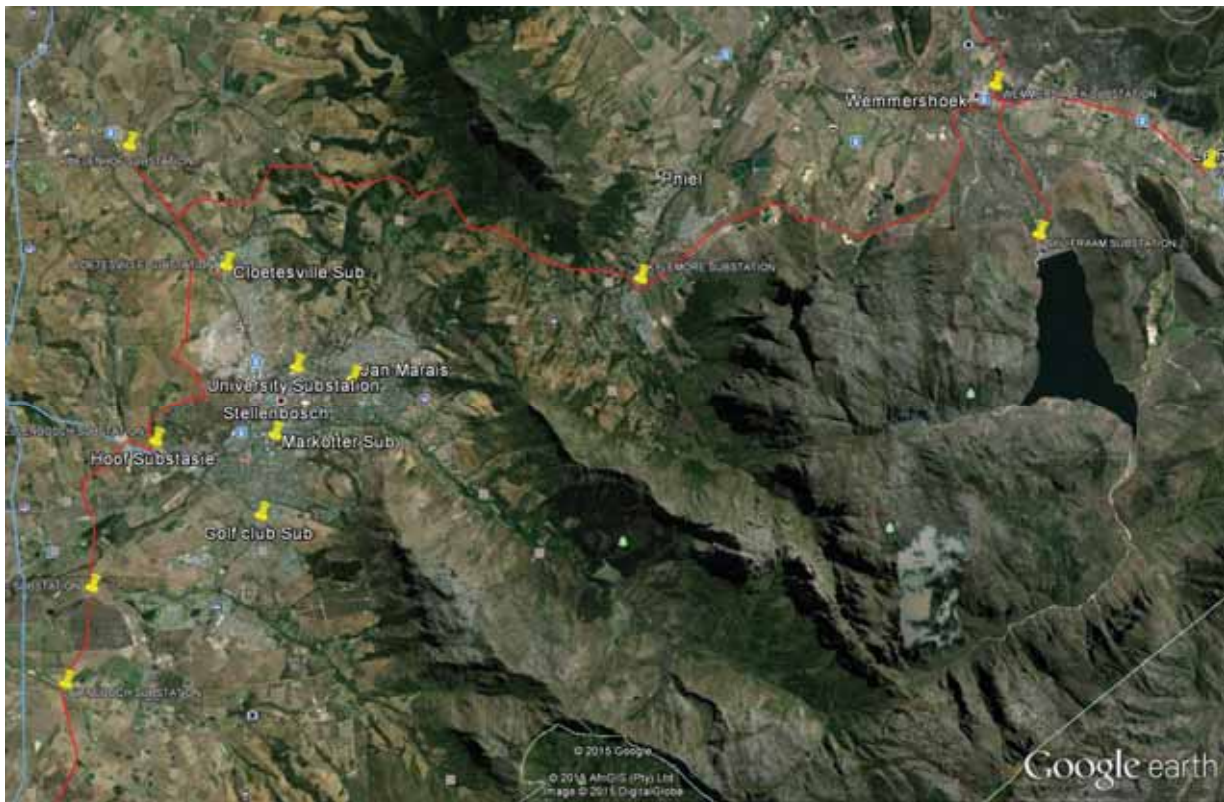


Figure 3-1 : 132 and 66 kV Eskom Networks in the Stellenbosch and Franschhoek areas

Table 3-1 summarizes the maximum demand of the Stellenbosch and Franschhoek areas. This information is critical in the assignment of the correct bulk MV loads in the model based on load forecast.

Table 3-1 : Analysis of Eskom supply maximum demand

Substation	Notified Maximum Demand	Maximum Demand	Sum of MV Maximum demands <sup>7</sup>	Supply point network diversity
Stellenbosch Main	60 MVA	59.7 MVA	70.9 MVA	0.84 <sup>8</sup>
Cloetesville	16 MVA	15.6 MVA	16.6 MVA	0.94
Franschhoek	9 MVA	8.8 MVA	10.5 MVA	0.88

The loading on the 66 kV network was assessed by applying a diversity factor of 0.94 based on the Cloetesville data. Diversity is not embedded in the Powerfactory models, hence two simulations were compiled:

<sup>7</sup> This value is the sum of the maximum demands of the 11 kV switching substations in the respective feed area.

<sup>8</sup> This includes the diversity on the bulk MV networks and the internal 66 kV network.

- Model with a load scaling of 1 to assess the loading on the bulk MV cabling and transformer loading.
- Model with a load scaling of 0.94 to assess the HV network.

### 3.3 General Discussion: Franschoek Existing Network

The Franschoek network consists of three substations, one being the main intake from Eskom and two switching substations. The maximum demands are indicated in Table 3-1.

### 3.4 Existing Network Loading

#### 3.4.1 HV network loading

The internal 66 kV network loading is summarized in Table 3-2 and are sufficient for the current requirements.

OUTAGE ▼	66 kV Feeder Loading						
	Main-Univ	Main-SGC	Main-Markotter	Markotter-Univ	SGC-Markotter	Univ-Jan Marais	Markotter-Jan Marais
Main-Univ	0 %	22%	81%	36%	0%	0%	49%
Main-SGC	60%	0 %	41%	0%	20%	49%	0%
Main-Markotter	60%	45%	0 %	0%	21%	49%	0%
Markotter-Univ	36%	22%	45%	0 %	0%	0%	49%
SGC-Markotter	36%	22%	45%	0%	0 %	0%	49%
Univ-Jan Marais	36%	22%	45%	0%	0%	0 %	49%
Markotter-Jan Marais	60%	22%	22%	0%	0%	49%	0 %

Table 3-2 : Existing 66 kV Network Loading

#### 3.4.2 66/11 kV Transformer Loading

The table below states the contingency capacity (or firm capacity) and the current loading of each substation.

SUBSTATION	CONTINGENCY CAPACITY (N-1)	CURRENT LOADING
Main Substation	15 MVA	11.3 MVA

Markotter	15 MVA	12.9 MVA
University	30 MVA	21.0 MVA
Jan Marais	10 MVA	14.3 MVA
Golf Club	20 MVA	12.2 MVA
Cloetesville	20 MVA	16.9 MVA
Franschhoek	20 MVA	10.5 MVA

Table 3-3 : Existing Network Transformer Loading

Notes on Table 3-3:

- Jan Marais substation does not afford N-1 contingency and a component outage/failure will result in customers being without electricity, possibly for extended periods.
- The balance of the substations have sufficient capacity.

### 3.4.3 11 kV Feeder Loading

The bulk 11 kV feeders from main transformation substations to switching substations were modelled. Table 3-4 provides a summary of the cables which will be overloaded in a contingency scenario (i.e. N-1 condition).

SUBSTATION	CONTINGENCY LOADING
Distell	110%
Curry (see note 2)	107%

Table 3-4 : Existing Network 11 kV Cable Overloading (N-1)

Notes on Table 3-4:

1. Currently Begraafplaas is also overloaded in the N-1 state, however if the Distell overloading is corrected this will improve the situation at Begraafplaas to the extent that it is no longer a concern.
2. Currently cables have been installed, but not yet commissioned, directly between Cloetesville and Tennant substations. If these 185 mm<sup>2</sup> cables are commissioned the contingency loading on Curry is acceptable.

### 3.4.4 Voltage Regulation

Voltage regulation at the 66/11 kV and 11/11 kV substations is within the limits as discussed in Section 3.1.

## 3.5 Existing Network Year 20 Loading

Loads in the existing network model were adjusted according to the forecast for 2034 (as described in Section 2.6). This is not a realistic or likely scenario as the resulting loads exceed the existing network capacity by impractical amounts. However, the simulation provides useful insight as to where, and to what extent, future expansion will be required.

### 3.5.1 HV Network Loading

OUTAGE ▼	CONTINGENCY CAPACITY (LOCATION)	FORECAST LOADING		
		HG	RG	LG
Main-Univ <sup>9</sup>	98 MVA (Markotter)	92 MVA	73 MVA	68 MVA
Main-SGC	55 MVA (University)	53 MVA	47 MVA	40 MVA
Main-Markotter	51 MVA (SGC)	38 MVA	31 MVA	28 MVA
Markotter-Univ	55 MVA (Markotter)	38 MVA	31 MVA	29 MVA
SGC-Markotter	55 MVA (Markotter)	38 MVA	31 MVA	29 MVA
Univ-Jan Marais	27 MVA (Jan Marais)	25 MVA	19 MVA	17 MVA
Markotter-Jan Marais	27 MVA (Jan Marais)	25 MVA	19 MVA	17 MVA

Table 3-5 : Existing HV Network Loading at Study Horizon

Notes on Table 3-5:

- “Contingency Capacity” is defined as the capacity available at the indicated substation under the stated outage condition.

It is noted that the HV cabled network is sufficient (albeit marginal in a few instances) for the forecasted loading. No HV cable upgrades are proposed as part of this master plan. It is however strongly recommended to monitor the loading on the internal HV network. If growth rates in line with the high growth scenario materialize critical assessment of the HV network will be required at that stage.

<sup>9</sup> This is achieved by utilizing the Golf Club – Markotter link.

### 3.5.2 66/11 kV Transformer Loading

As expected, additional transformation capacity will be required for the forecast load, as indicated in the following table:

SUBSTATION	CONTINGENCY CAPACITY	FORECAST LOADING		
		HG	RG	LG
Main Substation	15 MVA	24 MVA	16 MVA	13 MVA
Markotter	15 MVA	15 MVA	14 MVA	13 MVA
University	30 MVA	30 MVA	25 MVA	22 MVA
Jan Marais	10 MVA	27 MVA	19 MVA	17 MVA
Golf Club	20 MVA	28 MVA	19 MVA	16 MVA
Cloetesville	20 MVA	62 MVA	32 MVA	26 MVA
Franschhoek	20 MVA	27 MVA	18 MVA	15 MVA

Table 3-6 : 66/11 kV Transformer Loading at Study Horizon

Notes on Table 3-6:

- The load forecast for the Cloetesville Substation justifies the construction of new 66/11 kV substation/s.

### 3.5.3 11 kV Feeder Loading

When future loads are imposed on switching substations the magnitude of the load growth falls into three categories:

1. Growth warrants the construction of one or multiple new switching substations.
2. Growth exceeds the capacity of the substation, but to such a degree that the creation of a new switching substation is not warranted.
3. Growth does not exceed capacity.

Table 3-7 provides a summary of the forecast growth for 11/11 kV switching substations falling with categories 1 and 2:



GROWTH CAT.	SUBSTATION	CONTINGENCY CAPACITY	FORECAST LOAD		
			HG	RG	LG
1.	Polkadraai	4.5 MVA	9.4 MVA	5 MVA	4 MVA
	Watergang	3.8 MVA	23 MVA	11 MVA	8 MVA
	Groendal	6.4 MVA	17 MVA	10 MVA	8 MVA
2.	Engineering Faculty	4.5 MVA	6.6 MVA	4 MVA	4 MVA
	Uniepark	2.6 MVA	7.3 MVA	6 MVA	5 MVA
	Langstraat Suid	4.5 MVA	7.3 MVA	4 MVA	4 MVA
	Hugenote	6.4 MVA	8.8 MVA	7 MVA	7 MVA

Table 3-7 : 11kV Feeders Loading at Study Horizon

#### 3.5.4 Voltage Regulation

As this simulation is not a realistic scenario, no voltage regulation data is provided.

#### 4. CONDITION ASSESSMENT OF EXISTING INFRASTRUCTURE

The master plan aims to account for the planned replacement of existing infrastructure where the condition of equipment requires such. RHDHV assessed the condition of all medium voltage switch yards and medium voltage street furniture. The assessment was limited to a visual inspection, from the ground, under energised conditions. The primary purpose was to ascertain what electrical infrastructure should be replaced or upgraded as part of the master plans. The condition so determined was kept in mind when considering future network development plans.

The visual inspections were performed in October 2014 and May 2015 for the MV and HV installations respectively. The assessment and recommendations that follow are derived directly from the visual inspections. During the inspection the team collected photographs and equipment nameplate information for inclusion in the network model. The team further noted general observations, not strictly falling within the scope of the study. These have been included in this section of the report for information and inclusion in routine maintenance plans.

This section provides a summary of the condition assessment recommendations which are explained in the sections that follow. Refer to Appendix C for a more detailed record of the condition assessment and information gathered.

##### 4.1 HV/MV Power Transformers

Planned replacements during the study window of the following 66/11 kV transformers are proposed<sup>10</sup>:

Table 4-1 : Planned Replacements of Power Transformers

Substation	Transformers to be replaced	Typical age of transformers
Stellenbosch Main	Transformer 1, 2 and 3	43 years (1971)
Jan Marais	Transformer 1 and 2	36 years (1979)
Markotter	Transformer 1, 2 and 3	43 years (1971)

<sup>10</sup> Notwithstanding this the upgrade of transformers to increase substation capacity might be required and is discussed in Section 5.

This recommendation to replace power transformers has been based primarily on the age of the units and their expected design life. In reality, “there is no simple and unique end-of-life criterion that can be used to quantify the remaining life of a transformer” (International Electrotechnical Commission, 2005). Aging, or the rate of deterioration, depends on many factors, such as the operating temperature, the number, magnitude and frequency of temperature excursions, the moisture content, and the oxygen content (amongst others).

The Eskom power transformer specification requires a design life of 35 years at rated conditions (Eskom Distribution, 2010) and it is considered likely that the units were built to an Eskom specification (although this has not been verified). The master plan makes provision for the replacement of all units that reach 40 years old.

Given the high cost of the HV/MV power transformers (and associated lead time to motivate and secure the necessary replacement budgets) and the time to procure and install new transformers, it would be advisable for the Municipality to continue oil sampling, purification and analysis on a regular basis

#### **4.2 MV Switchboards**

Much of the Municipality’s MV switchgear has exceeded the generally accepted useful life span of 35 years. It is also evident that the Municipality have been proactive in upgrading MV switchboards over the past 5 years and a number of the installations have recently been upgraded, refurbished and/or serviced. Oil-filled switchgear has largely been replaced with Vacuum/SF<sub>6</sub> switchgear. An example of a recent switchboard replacement is shown in Figure 4-1.



Figure 4-1 : Newly Upgraded Suidwal Substation

The majority of the Municipality's substations still utilise oil-filled circuit breakers, with various obsolete models of Reyrolle, Long & Crawford and Yorkshire Switchgear still in operation. RHDHV recognises that the Municipality has started mitigating the risks associated with such an aged "fleet" of switchgear over the past 5 years. It is recommended that the continued replacement of obsolete switchboards in all substations be pursued in line with the findings of this condition assessment and the Municipality's switching risk assessments.



Figure 4-2 : Oil-filled Switchgear at Paradyskloof Substation

### 4.3 Protection Relays

Protection equipment information is provided in Appendix C. A detailed protection study and audit was outside the scope of the master plan appointment.

Provided that the protection equipment continues to meet the protection philosophy requirements, is reliable, and continues to be tested and maintained there is no necessity to replace the relays. Obsolescence and availability of spare parts or replacement relays may be a concern in future years. Replacements motivated on this basis would depend on the Municipality's risk tolerance as failure rates are low. It is recommended that the 11 kV protection relays continue to be upgraded as part of anticipated on-going switchboard replacements.

The condition of battery tripping units and in particular the batteries appear to be good, although the battery tripping units and battery rooms were not always accessible. Protection equipment is reliant on the provision of a supply from these batteries for tripping purposes. The BTUs are a critical part of the substation and RHDHV recommends that they be thoroughly serviced and load tested at regular intervals. The selection of an alternate battery type might offer reduced maintenance requirements to ensure maximum reliability (e.g. flooded nickel-cadmium or ultra-low maintenance recombination cells).

### 4.4 General Maintenance Recommendations

The remaining items are of a general maintenance nature and have been recorded here for information and inclusion in routine maintenance plans.

Transformer oil leaks are self-explanatory. These leaks present a risk to the reliability of supply (if not attended to, the Buchholz relay will eventually trip on low oil) and to the environment (as the transformer bays are not all provided with oil containment facilities). It was noted that there is a low occurrence of oil leakages throughout the Municipality's distribution system. From an environmental and social responsibility point of view, leaks should continue to be treated as a priority and oil containment facilities are recommended for future projects and upgrades. "A single drop of used motor oil can contaminate a million drops of water" (British Columbia Used Oil Management Association, 2007).

Recent industry practise is to consider arc protection for air-insulated switchboards, particularly of the withdrawable, metal-clad type. Arc protection could be considered as part of the overall protection philosophy in the future and retrofitted to existing switchboards (if required).

Many of the substations are not adequately protected against water and vermin ingress. All cable entries and exits should be sealed. This will also provide improved protection against a fire “travelling along” the cable route and into the substation (i.e. will provide a measure of fire-stopping). Snakes and other vermin entering substations present both a health and safety risk to personnel and potentially reduce the reliability of the supply (seeking a dark / warm environment they might short-circuit terminals or busbars). The risk of water ingress is aggravated by missing/broken trench covers and open trenches in some instances. Where evidence of rat activity was found, increased pest control measures should be adopted and the frequency of visual inspections of affected enclosures increased until the rat infestation has abated.



(a) An opening viewed from inside (Stone)



(b) Sealing concerns (Amantoni)

Figure 4-3 : Substation Sealing Concerns (Example Photos)

General maintenance in the outdoor yards includes items such as topping up the crushed stone layer, repairing fencing, repairing soil erosion, and weeding and weed-control treatment.

Missing or damaged minisub roof bolts poses the risk of a minisub roof being lifted by excessive winds. Although this risk is not assessed with a very high likelihood, the impact could be severe and the risk can be readily mitigated by replacing roof bolts as required.

Earthing installations at outdoor switchgear were visually assessed and no continuity tests were conducted. In general, the earthing installations were found to be adequate and in a good condition. It is recommended that the isolated instances of poor or damaged earthing installations be repaired.

## 5. SYSTEM PLANNING AND FUTURE NETWORK LOAD FLOW STUDY

Following the load forecast and load flow study of the existing network, this section aims to develop a suitable future network to alleviate the constraints identified in the current network and to cater for the forecast network load.

### 5.1 Proposed Future Network

The proposed network is based on supporting the high growth scenario at the study horizon. Additions that will not be required in the realistic and low growth scenarios will be identified in the corresponding project schedule presented in Section 6.1.

The proposed network is represented in the following drawings, which have been included in Appendix D<sup>11</sup> and Appendix E:

DRAWING NUMBER	TITLE
I01.CPT.000127/E10	Plan Layout of Network: Stellenbosch (2034)
I01.CPT.000127/E11	Plan Layout of Network: Franschoek (2034)
I01.CPT.000127/E20	Stellenbosch Network Overview, current network
I01.CPT.000127/E21	Main Substation SLD, Current network
I01.CPT.000127/E22	Markotter Substation SLD, Current network
I01.CPT.000127/E23	University Stellenbosch Substation SLD, Current network
I01.CPT.000127/E24	Jan Marais Substation SLD, current network
I01.CPT.000127/E25	Golf Club Substation SLD, Current network
I01.CPT.000127/E26	Cloetesville Substation SLD, Current network
I01.CPT.000127/E28	Franschoek Substation SLD, Current network
I01.CPT.000127/E30	Stellenbosch Network Overview, High growth
I01.CPT.000127/E31-E38	Substation SLD's, High growth
I01.CPT.000127/E40	Stellenbosch Network Overview, Realistic growth
I01.CPT.000127/E41-48	Substation SLD's, Realistic Growth

Table 5-1 : Drawing Register

It is noted that the light yellow, semi transparent line style in the current network drawings (I01.CPT.000127/E2x series) denote the proposed expansions, which is shown in solid colours after proposed implementation (I01.CPT.000127/E3x and E4x series).

<sup>11</sup> Drawings in the E2x, E3x and E4x series are screenshots from the DIgSILENT PowerFactory® model of the electrical network.



### 5.1.1 Kayamandi 66/11 kV Substation

As can be seen in the growth profile of Table 3-6 there is a requirement to construct a new HV/MV substation in the Kayamandi area. The location of the substation is proposed to be close to the 66 kV OHL to the north of Stellenbosch as indicated in Figure 5-1.



Figure 5-1 : Possible locations for the proposed Kayamandi Substation

The following table indicates possible key aspects of the substation.

Table 5-2 : Proposed key aspects of the Kayamandi Substation

Aspect	Proposal
Owner and Operator of HV yard	Eskom
Municipal Supply Voltage	11kV
Arrangement into Eskom network	Spur feed from the Koelenhof/Stellenbosch 66 kV line (similar to the Cloetesville Substation arrangement).
Transformer arrangement	Three 20MVA transformers to a firm capacity of 40MVA.

This substation will supply all new developments in the Kayamandi area and will incorporate the existing network on the western side of the R304.

Having the Kayamandi substation owned and operated by Eskom will have the least impact on capital expenditure as the rural OHL is, and shall remain Eskom property. The substation could either be constructed by Eskom themselves, or by the Municipality under a HV Self-build contract. The latter might have benefits to the Municipality in terms of project lead time and capital cost.

### *5.1.2 Upgrade of Langstraat Suid Substation*

To supply the developments in the Langstraat Suid area an upgrade to the substation is required. The following is proposed:

1. Create a new, brick built substation adjacent to the current substation.
2. Equip the substation with new switchgear.
3. Install bulk 11kV feed from Curry substation by means of two 185mm<sup>2</sup> Cu cables.
4. Transfer the current feeders to the new substation.
5. Transfer the incomers from Tennant substation to the new substation.
6. Demolish the current substation building.

This upgrade will build on the strong network in the Cloetesville area and afford sufficient capacity for the proposed developments.

### *5.1.3 New Kwarentyn 11kV substation*

To supply the proposed developments on the southern side of Polkadraai road, opposite the industrial area, a substation is required. Due to the following reasons this substation is planned to be fed directly from the Stellenbosch Main substation:

- Substantial capacity required (9.4MVA) that would require four (4) bulk in-feed cables.
- Strengthening of the Distell network is required and will be included with this upgrade.

In the low growth scenario this upgrade could be implemented in phases with the first phase being the installation of the cables into Polkadraai Substation. The subsequent phases will build on this expansion to create the cable feeds into Kwarentyn Substation.

#### *5.1.4 Upgrade of the Stellenbosch Main Substation 66/11kV transformers*

Due to the increase in load to the Kwarentyn substation, firm capacity at Stellenbosch Main substation will be exceeded. As the transformers are 7.5 MVA and are aging (manufactured in 1971) an upgrade to these these transformers is proposed. An upgrade to three 15 MVA units will be sufficient for current growth predictions. The option to upgrade to 20 MVA units for standardisation purposes could also be considered.

#### *5.1.5 Upgrade of the Jan Marais Substation*

Currently the load on the Jan Marais substation exceeds the contingency capacity. Further to this, expansion is planned for the area, and hence an upgrade is required. The proposed upgrade entails the upgrade of the installed 10 MVA transformers to 20 MVA. This will increase the firm capacity to 20 MVA. To achieve the high growth study horizon rating of 27 MVA a third transformer bay will have to be constructed and equipped. This will increase the contingency capacity of the substation to 27 MVA (limited by in-feed cable size).

An alternative to create an Idas Valley 66/11kV Substation was investigated; this was however not seen as cost efficient as this substation with typical capacities between 20 and 40 MVA will be created to supply the envisaged 6.6 MVA. It is however seen that the Idas Valley HV substation will be required out of the study horizon. When this substation is created an additional HV infeed into Jan Marais is possible, unlocking the full transformer capacity of 40 MVA.

#### *5.1.6 Install Third Transformers*

The installation of a third 20 MVA transformer at HV/MV substations is seen as a cost effective way to double the contingency capacity. This is proposed for Golf Club, Cloeteville and Franschoek substations. The installation of the third transformer will entail an increase to the substation platform footprint, the extension of 66 kV bus-bars, and a possible MV switchboard extension or upgrade.

#### *5.1.7 Increased Capacity at Groendal*

To increase the capacity at the Groendal Substation the installation of a third and fourth 185mm<sup>2</sup> cable is proposed. As the unit protection scheme is installed on the incomers this

will be a suitable arrangement. This will increase the capacity at Groendal to 14 MVA against the study window of 17MVA. During this time growth needs to be monitored and if required an additional MV/MV substation could be installed to create required capacity. The final placement of the MV/MV substation is to be confirmed. It is proposed that the new MV/MV substation, for interim purposes deemed Groendal 2, is directly fed from the Fransshoek Substation.

#### 5.1.8 Additional cables to Uniepark, Hugenote and Engineering faculty

To alleviate the overloading at Uniepark, Hugenote and Engineering Faculty Substations the installation of additional cables as indicated in Table 5-3 is proposed.

Substation	Requirements	Notes
Uniepark	Install a second bulk feeder into Unipark	Extension of switchgear will be required
Hugenote	Install third and fourth cables to Hugenote substation	The use of unit protection to be included in the new cables to enable parallel operation.
Engineering Faculty	Install larger cables	The installation of 185mm <sup>2</sup> Cu to replace the 150 mm <sup>2</sup> Al cables

Table 5-3 : Details of various cable upgrades

## 5.2 Future Network – 2032 Loading (Year 20)

The network as described in Section 5.1 was modelled in detail and is comprehensively captured in the series of SLD drawings as attached (I01.CPT.000127/E3x and E4x). These networks afford the required capacity in the normal and contingency state.

The next table summarizes the proposed firm transformer capacity of the HV to MV substations at the study horizon.

SUBSTATION	PROPOSED FIRM CAPACITY		
	HG	RG	LG
Main Substation	40 MVA	40 MVA	15 MVA
Markotter	15 MVA	15 MVA	15 MVA
University	30 MVA	30 MVA	30 MVA
Jan Marais	40(27) MVA <sup>12</sup>	40(27) MVA	20 MVA
Golf Club	40 MVA	20 MVA	20 MVA
Cloetesville	40 MVA	20 MVA	20 MVA
Franschhoek	40 MVA	20 MVA	20 MVA
Kayamandi	40 MVA	20 MVA	20 MVA

Table 5-4 : Proposed substation firm transformer capacity at study horizon

### 5.3 Future Land-Use

It is assumed that all MV cables will be installed in road reserves, and sites for the new switching substations will be made available as part of the development and are therefore not listed below.

#### 5.3.1 New Kayamandi Substation

The proposed site was purely selected on proximity to the load and access to the 66 kV OHL. The area needs to be investigated in detail and site selection to be made according to various factors (geographically, accessibility, availability etc.).

<sup>12</sup> 40 MVA firm transformer capacity, limited to 27 MVA based on cable capacity.

### 5.3.2 Additional Transformer bay's

The following list indicates the impact on current substations that will have to be enlarged to accommodate the third transformer bay.

Substation	Direction of Expansion	Notes
Jan Marais	West	Possibly encroaching on the Jan Marais Park Nature Reserve.
Cloetesville	North	
Golf Club	Unknown	Substation third bay to be equipped in line with original design.
Franschhoek	South	Southern side of incoming feeder

Table 5-5 : Land implication of the installation of the third transformer

### 5.4 Future NMD for each Point of Supply

The notified maximum demand for each Eskom point of supply, in accordance with the recommendations for the future network development, are summarised below in Table 5-6.

HIGH GROWTH			
Point of Supply	2014	2024	2034
Stellenbosch Main	60 MVA	71 MVA	100 MVA
Cloetesville	16 MVA	17 MVA	24 MVA
Franschhoek	9 MVA	15.5 MVA	27 MVA
Kayamandi	- MVA	10 MVA	24 MVA
REALISTIC GROWTH			
Point of Supply	2012	2022	2032
Stellenbosch Main	60 MVA	68 MVA	77 MVA
Cloetesville	16 MVA	15 MVA	18 MVA
Franschhoek	9 MVA	14 MVA	22 MVA
Kayamandi	- MVA	6 MVA	12.5 MVA

Table 5-6 : Envisaged NMD at Eskom Supply points

## 6. COSTING AND SCHEDULING OF PROJECTS

### 6.1 Project Schedules

Section 5.1 reports on the required network upgrades for the high growth scenario at the study horizon (i.e. 2034). This section of the report provides the associated project schedules, which cater for each of the three growth scenarios.

#### 6.1.1 Schedules to provide N-1 Redundancy

Section 3.4 provides a summary of all instances where N-1 redundancy in the existing network is not provided. All the efforts to alleviate these constraints, with the future expansion ambitions in mind, were scheduled in year 2 (2016). Thereafter the upgrades were driven by the load growth.

The dates in the schedules that follow indicate the date at which the specific project is to be commissioned. Equipment and procurement lead times have not been included.

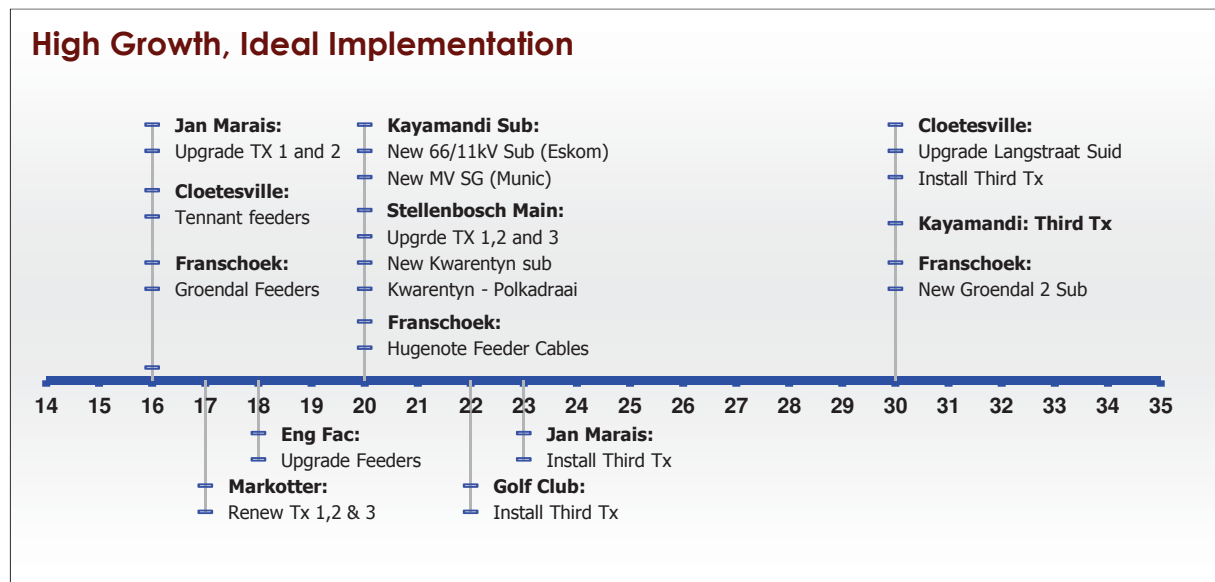


Figure 6-1 : Project Schedule - High Growth with N-1 Redundancy

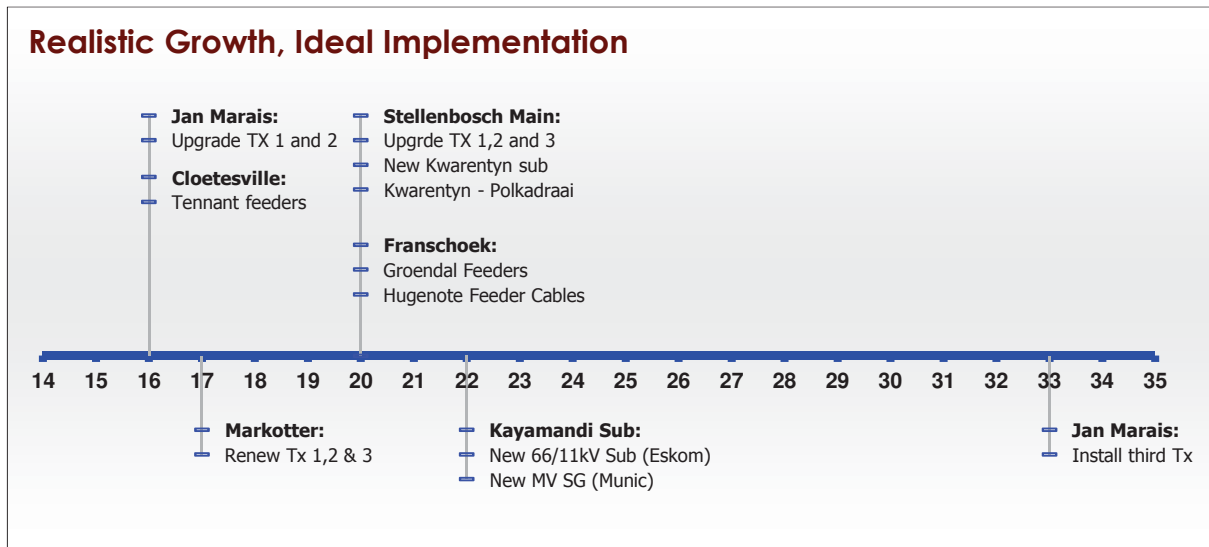


Figure 6-2 : Project Schedule - Realistic Growth with N-1 Redundancy

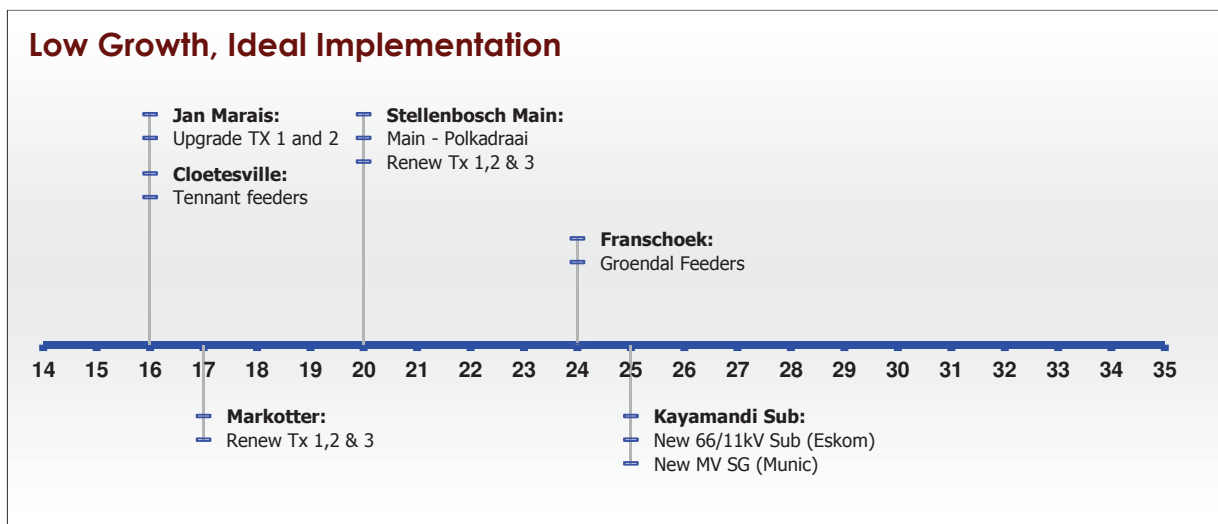


Figure 6-3 : Project Schedule - Low Growth with N-1 Redundancy

## 6.2 Cost Estimate Introduction

Provisional cost estimates are shown in Table 6-1 and Table 6-2. The estimates have been based on RHDHV database prices for recent projects.



## IMPORTANT!

The cost estimates *do not* include:

- Any costs associated with upgrading Eskom substations or equipment, nor any upstream network strengthening requirements; and
- Any costs associated with property acquisition or obtaining servitude rights or costs associated with amending existing servitude rights.

Table 6-1 shows the current cost estimates (2015). The costs shown are for the supply and installation of the equipment only. Professional engineering designs fees would typically be between 7 % and 11 % of the total cost of works; although for projects less than R 10 million fees could reach 15 % (Engineering Council of South Africa, 2015).

Table 6-2 shows the costs escalated at 6 % per annum from 2015 until the year in which the specific project is scheduled. The escalation rate has been based on South Africa's average inflation rate since 2000.

### 6.3 Basis of Cost Estimate

The following sections aim to provide insight into how the provisional cost estimates have been prepared. The basis notes are presented as a series of bullets categorised for each element of the estimate. In certain instances a qualification or caution is added where, in RHDHV's experience, the provisional costs presented are subject to change considerably.

#### 6.3.1 Substations

- HV Substation pricing has been based on recent similar projects.
- Indoor MV switchgear prices are based on estimates received from ABB for the Unigear range of air-insulated switchboards.

Substation costs vary considerably with the actual site, ground (geological) and hydrologic conditions. Bulk civil quantities, foundation designs, drainage and earth mat requirements are dependent on initial site and soil test work. These estimates are subject to vary considerably and should be firmed up once a few site options have been identified.

### 6.3.2 Power Transformers

- Power transformer prices have been based on budget prices received from Actom Transformers.
- The prices were for power transformers meeting Eskom standard specifications.
- The price includes transport and offloading.
- An allowance was made to cater for the procurement of slimline transformers to cater for the limited space afforded in the substations.

Transformer pricing is subject to fairly considerable variations based on factory workload. It is noted that currently demand for the larger transformers is low.

### 6.3.3 Cables

- Cable prices were received from Aberdare Cables.

Cable installation rates were obtained from recent contract prices for work in the Western Cape.

## 6.4 Provisional Cost Estimate: 2015 Base Prices

The following assists understanding the layout and format of the estimate:

- A short description of each planned development is provided.
- The total estimated value is placed in the column corresponding to the relevant scenario (on the right) in the row representing the year in which the development needs to take place.
- Some developments are repeated in more than one scenario and in different years. The first time a development is listed, it is provided with a description and the title is underlined. Thereafter only the title is shown with a short caption to refer to the previous description of that particular development.

YEAR	DESCRIPTION	UNIT	ESTIMATED 2015 PRICES		
			HIGH GROWTH	MOST-LIKELY GROWTH	LOW GROWTH
2016	<b>Jan Marais Upgrade</b> Remove Existing Tx 1 and 2 and replace with 20MVA units	Sum	R 15 593 755	R 15 593 755	R 15 593 755
	<b>Comission Tennant feeders</b> Install MV switchgear and comission sub with previously installed cables	Sum	R 4 250 000	R 4 250 000	R 4 250 000
	<b>Upgrade Groendal feeders</b> 11kV 3 core 185mmsq PILC(Table19) copper cabling, 2km	Sum	R 2 164 129		
2017	<b>Markotter Upgrade</b> Remove Aged Existing Tx 1, 2 and 3 and replace with New units	Sum	R 22 011 000	R 22 011 000	R 22 011 000
2018	<b>Upgrade Engineering Fac feeders</b> 11kV 3 core 185mmsq PILC(Table19) copper cabling, 0.5km	Sum	R 476 108		
2019					
2020	<b>Kayamandi Sub - HV</b> Create 66/11 kV substation complete	Sum	R 45 900 000		
	<b>Kayamandi Sub - Munic MV/MV</b> Substation building and switchgear	Sum	R 5 450 000		
	<b>Stellenbosch Main - Tx upgrade</b> Remove Existing Tx 1, 2 and 3 and replace with 20MVA units	Sum	R 22 011 000	R 22 011 000	
	<b>Stellenbosch Main - Kwarentyng sub</b> Substation building and switchgear	Sum	R 5 450 000	R 5 450 000	
	<b>Kwarentyng Sub cables</b> 11kV 3 core 185mmsq PILC(Table19) copper cabling, 3.8km	Sum	R 4 111 845	R 4 111 845	
	<b>Franshoek - Hugentoe feeder cables</b> 11kV 3 core 185mmsq PILC(Table19) copper cabling, 5.2km	Sum	R 5 626 735	R 5 626 735	
	<b>Franshoek: Upgrade Groendal feeders</b> 11kV 3 core 185mmsq PILC(Table19) copper cabling, 2km	Sum		R 2 164 129	
	<b>Stellenbosch Main Upgrade</b> Renew Transformers 1, 2 and 3. 11kV 3 core 185mmsq PILC(Table19) copper cabling from Stellenbosch Main to Polkadraai, 1km.	Sum			R 23 038 961
2021					
2022	<b>Kayamandi Sub - HV</b> Create 66/11 kV substation complete	Sum		R 45 900 000	
	<b>Kayamandi Sub - Munic MV/MV</b> Substation building and switchgear	Sum		R 5 450 000	
	<b>Golf Club Third Tx</b> Add third 20MVA transformer	Sum	R 7 337 000		
2023	<b>Jan Marais- Third Tx</b> Add third 20MVA transformer bay	Sum	R 14 475 000		
2024	<b>Franshoek - Groendal feeders</b> 11kV 3 core 185mmsq PILC(Table19) copper cabling, 2km	Sum			R 2 164 129

YEAR	DESCRIPTION	UNIT	ESTIMATED 2015 PRICES		
			HIGH GROWTH	MOST-LIKELY GROWTH	LOW GROWTH
2025	<b>Kayamandi Sub - HV</b> Create 66/11 kV substation complete	Sum			R 45 900 000
	<b>Kayamandi Sub - Munic MV/MV</b> Substation building and switchgear	Sum			R 5 450 000
2026					
2027					
2028					
2029					
2030	<b>Cloeteville: Upgrade Langstraat suid</b> New Substation building, switcgear and feeder cables	Sum	R 7 614 129		
	<b>Cloeteville: Third Tx</b> Add third 20MVA transformer	Sum	R 7 337 000		
	<b>Franschoek: New Groendal 2 Sub</b> Substation building, switchgear and	Sum	R 7 614 129		
	<b>Kayamandi: Third Tx</b> Add third 20MVA transformer	Sum	R 7 337 000		
2031					
2032					
2033	<b>Jan Marais</b> Add third 20MVA transformer bay	Sum		R 14 475 000	
2034					
2035					
		<b>Total</b>	<b>R 184 800 000</b>	<b>R 147 100 000</b>	<b>R 118 500 000</b>

Table 6-1 : Provisional Cost Estimate (2013 Base Prices)

## 6.5 Provisional Cost Estimate: Escalated Prices

The estimate below is similar to that provided in Section 6.4. The developments and the year in which each is planned remains the same. However, the estimated cost of the development has been escalated at 6 % per annum from the 2013 base year to the year in which the development is planned.

Please refer to the introductory notes of Section 6.4 if clarity on the layout and format of the estimate is required.

YEAR	DESCRIPTION	UNIT	Escalated 2015 PRICES		
			HIGH GROWTH	MOST-LIKELY GROWTH	LOW GROWTH
2016	<b>Jan Marais Upgrade</b> Remove Existing Tx 1 and 2 and replace with 20MVA units	Sum	R 16 529 380	R 16 529 380	R 16 529 380
	<b>Comission Tennant feeders</b> Install MV switchgear and comission sub with previously installed cables	Sum	R 4 505 000	R 4 505 000	R 4 505 000
	<b>Upgrade Groendal feeders</b> 11kV 3 core 185mmsq PILC(Table19) copper cabling, 2km	Sum	R 2 293 977		
2017	<b>Markotter Upgrade</b> Remove Aged Existing Tx 1, 2 and 3 and replace with New units	Sum	R 24 731 560	R 24 731 560	R 24 731 560
2018	<b>Upgrade Engineering Fac feeders</b> 11kV 3 core 185mmsq PILC(Table19) copper cabling, 0.5km	Sum	R 567 053		
2019					
2020	<b>Kayamandi Sub - HV</b> Create 66/11 kV substation complete	Sum	R 61 424 554		
	<b>Kayamandi Sub - Munic MV/MV</b> Substation building and switchgear	Sum	R 7 293 329		
	<b>Stellenbosch Main - Tx upgrade</b> Remove Existing Tx 1, 2 and 3 and replace with 20MVA units	Sum	R 29 455 683	R 29 455 683	
	<b>Stellenbosch Main - Kwarentyn sub</b> Substation building and switchgear	Sum	R 7 293 329	R 7 293 329	
	<b>Kwarentyn Sub cables</b> 11kV 3 core 185mmsq PILC(Table19) copper cabling, 3.8km	Sum	R 5 502 576	R 5 502 576	
	<b>Franshoek - Hugentoe feeder cables</b> 11kV 3 core 185mmsq PILC(Table19) copper cabling, 5.2km	Sum	R 7 529 841	R 7 529 841	
	<b>Franshoek: Upgrade Groendal feeders</b> 11kV 3 core 185mmsq PILC(Table19) copper cabling, 2km	Sum		R 2 896 093	
	<b>Stellenbosch Main Upgrade</b> Renew Transformers 1, 2 and 3. 11kV 3 core 185mmsq PILC(Table19) copper cabling from Stellenbosch Main to Polkadraai, 1km.	Sum			R 30 831 327
2021					
2022	<b>Kayamandi Sub - HV</b> Create 66/11 kV substation complete	Sum		R 69 016 629	
	<b>Kayamandi Sub - Munic MV/MV</b> Substation building and switchgear	Sum		R 8 194 785	
	<b>Golf Club Third Tx</b> Add third 20MVA transformer	Sum	R 11 032 135		

YEAR	DESCRIPTION	UNIT	Escalated 2015 PRICES		
			HIGH GROWTH	MOST-LIKELY GROWTH	LOW GROWTH
2023	<b>Jan Marais- Third Tx</b> Add third 20MVA transformer bay	Sum	R 23 070 951		
2024	<b>Franshoek - Groendal feeders</b> 11kV 3 core 185mmsq PILC(Table19) copper cabling, 2km	Sum			R 3 656 250
2025	<b>Kayamandi Sub - HV</b> Create 66/11 kV substation complete	Sum			R 82 199 909
	<b>Kayamandi Sub - Munic MV/MV</b> Substation building and switchgear	Sum			R 9 760 120
2026					
2027					
2028					
2029					
2030	<b>Cloetesville: Upgrade Langstraat suid</b> New Substation building, switcgear and feeder cables	Sum	R 18 247 703		
	<b>Cloetesville: Third Tx</b> Add third 20MVA transformer	Sum	R 17 583 547		
	<b>Franshoek: New Groendal 2 Sub</b> Substation building, switchgear and	Sum	R 18 247 703		
	<b>Kayamandi: Third Tx</b> Add third 20MVA transformer	Sum	R 17 583 547		
2031					
2032					
2033	<b>Jan Marais</b> Add third 20MVA transformer bay	Sum		R 41 316 559	
2034					
2035					
<b>Total</b>			<b>R 272 900 000</b>	<b>R 217 000 000</b>	<b>R 172 300 000</b>

Table 6-2 : Provisional Cost Estimate (Escalated Prices)

### 6.6 Cash Flow Forecast

The cash flow forecast, for projects recommended to ensure at least one level of redundancy (N-1) at all substations is fairly evenly spaced (refer to Figure 6-4). This would represent an ideal scenario, that is, to be in a position to almost immediately address the lack of redundancy at substations. It is recommended to build on the current strong network (i.e. most of the networks do have firm capacity) to achieve redundancy by motivating the capital expenditure. The graph in Figure 6-4 has been moderated by dividing the expenditure on significant projects (Kayamandi Substation, Stellenbosch Main upgrades) into two years. This moderation is seen as practical as it is unlikely that these projects will be completed in one financial year. Further moderation (e.g. producing a levelled cash flow implementation) was also not seen as value adding as it will stretch the significant projects for extended periods to achieve.

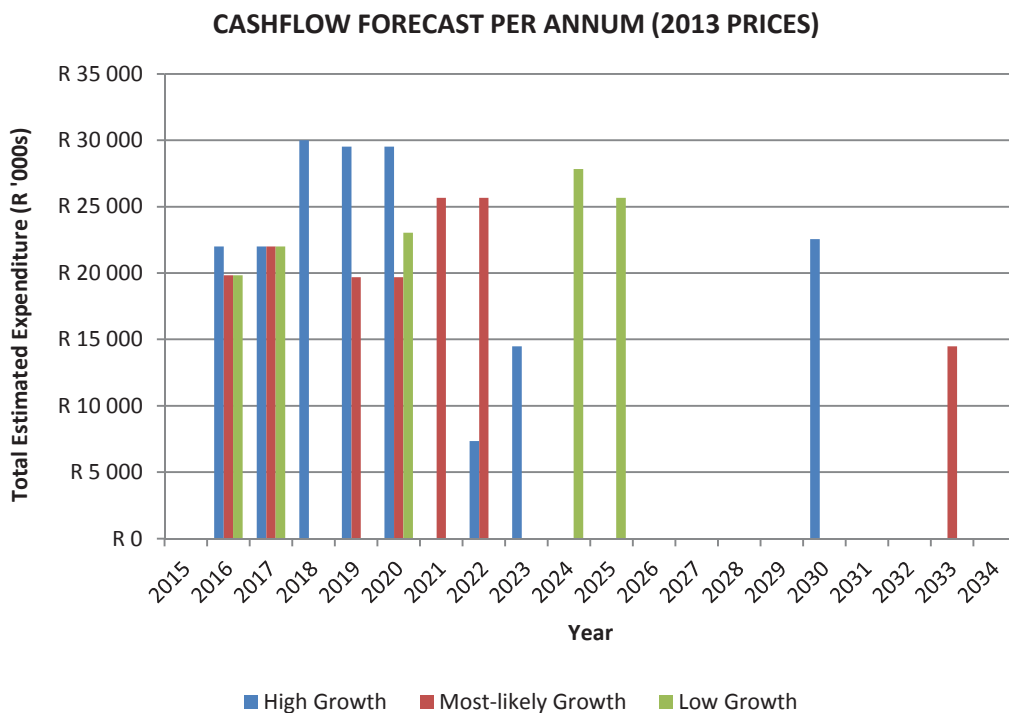


Figure 6-4 : Cash Flow Forecast of Estimated Expenditure

## 7. CONCLUSION

Stellenbosch Municipality appointed Royal HaskoningDHV for professional services, under contract no. B/SM 50/14 - PO295678, to prepare a 20 year electrical infrastructure master plan for the Municipality. This report presents the master plan.

RHDHVs approach to completing the task is outlined as follows:

- **Data Collection and Verification:** Review of all relevant technical data provided for the study including the previous master plan, network information, drawings, IDP report, and town planning documentation. This task included meetings with the Electrical Department, town planners, Housing Department and Stellenbosch University to gain further insight into the development plans and priorities for the Municipal area.
- **Load Forecast Development:** Prepare low, most-likely and high growth scenario forecasts based on the information gathered. These forecasts took into consideration historic growth in energy demand, population growth statistics, town planning and housing objectives, and known future developments. Key electricity consumers were contacted to confirm their respective expansion (or contraction) plans.
- **Supply areas** were divided into three categories; Main, Secondary and Rural. Main supply areas (e.g. Stellenbosch) will be subjected to load forecast and network modelling as the bulk infrastructure resides with the Municipality. Secondary supplies (e.g. Jamestown) will only be subjected to load forecasting with no network modelling.
- **Load Flow Study:** Perform a load flow study of the existing network utilising DIgSILENT PowerFactory® to assess the capacity of the network to meet the different growth scenarios. A network model was prepared and used to study the network under various operational and contingency scenarios.
- **Condition Assessment of Existing Infrastructure:** Visual inspection of all HV/MV and MV/MV substations to assess the condition of the electrical equipment and the potential for expansion (if required). During the inspections equipment nameplate information was recorded for use in the network model. Condition assessment was incorporated into the future network development plans.



- Future Network Design: Prepare conceptual designs of a future network considering the load forecast scenarios and constraints of the existing system. This included further load flow modelling incorporating “expansion stages” to simulate the time sequence of network upgrades. Land-use requirements were considered and briefly reported on together with the likely notified maximum demands at each Eskom point of supply for year-10 and year-20.
- Network Development Timelines: Project schedules were prepared to schedule network developments into the correct year.
- Provisional Cost Estimate Preparation: Based on the future network development plans and schedules, provisional cost estimates were prepared using RHDHV database prices and cost estimating tools together with the occasional budgeted prices from suppliers for high cost items. These costs are presented in 2015 monetary terms and as escalated prices from 2015 to the date scheduled in the proposed project timeline.
- Cashflow Forecast: A cashflow forecast was prepared on the basis of the project schedules and provisional cost estimates.

In Stellenbosch the existing 11 kV distribution network is supplied from a 66 kV HV network which has adequate capacity and provides good operational flexibility under contingency conditions. The Stellenbosch Substation is a significant node and is supplied at 132kV. Internally a 66kV supply is derived to feed into the Stellenbosch Municipal network, as well as to feed the Eskom Rural 66 kV Network. The Eskom 66 kV rural network supplies Cloetesville, and further loads in the Upper Berg River Valley inclusive of the Franschoek Substation (a HV/MV substation). There is sufficient transformer capacity at most HV/MV substations, the exception being Jan Marais Substation load which currently exceeds the contingency capacity limit. Voltage regulation in the network is within accepted norms. A few of the 11 kV cables to switching / distribution substations are loaded beyond their contingency capacity limit. However, since the 11 kV network is fairly flexible this is not cause for immediate concern.

The growth in electricity demand for the past 9 years has been 3.0 and 4.1 % per annum for Stellenbosch and Franschoek respectively. The combined demand reached a peak of just over 75 MVA and 9 MVA for Stellenbosch and Franschoek respectively. The population

growth rate for the period 2001-2011 was 2.7 %, which was higher than the Western Cape growth rate for the same period.

The Municipality has made good progress providing access to electricity. The 2011 census indicated that 98.8 % of households had access to electricity. Therefore electrification projects are unlikely to be a significant contributor to future demand growth. The provision of housing remains a challenge for the Municipality, with 20 000 persons on the waiting list as at 2014.

The integrated development plan identifies a number of properties for future housing and industrial developments. Kayamandi and Groendal expansions are notable low income housing developments with 4600 and 1500 units planned for each. The Municipality has also successfully attracted developers of high income housing projects which is widespread in the municipal area. These residential property developments are a significant contributor to the future load. The Polkadraai commercial/industrial property is also of note at 11 ha.

The load forecast followed from an analysis of the available historic electricity use for the Municipality. Low, most-likely and high growth scenarios were based on percentage growth rates selected using primarily judgemental methods after studying the various population, town planning, and housing statistics. The growth rates were applied from the 2014 trendline electricity demand and a future development forecast used to cross-check the scenario growth rates.

The future development forecast was prepared in consultation with the Municipality and aimed to cater for all future development plans (residential, commercial and industrial). Residential loads were estimated using a typical ADMD value, whilst industrial and commercial loads were estimated based on the particular development. The number of units built per year and the priority of these respective developments correlated well with the future development forecast.

RHDHV made use of the future development forecast to apportion the scenario growth at year-20 to the respective substations (i.e. to guide the geographic placement of future load). This approach is considered appropriate and the associated risk is at the secondary substation level, where network development plans may be a little late in the situation where a specific development receives a higher priority than originally anticipated.

The forecast accuracy should be reasonably good for the first few years and will progressively decay as time progresses and unforeseen external factors come to bear. The low, most-likely and high growth scenarios aim to take account of this uncertainty to a certain extent. The resulting impact of forecast error will materialise primarily in the timing of the network development projects. The network development recommendations will remain valid but they may need to be delayed or brought forward based on the timing of actual future demand. This provides motivation for continued focus on the electricity metering systems at substation level to obtain reliable metering information and inform future decision making in accordance with this master plan. This is especially critical for the internal 66 kV cabled network as this is approaching the capacity limit at the study horizon.

At year-10 (2024) the combined demand is forecast to be in the range 97-107 MVA and this increases to a range of 127-157 MVA in year-20 (2034). As the load increases Cloeteville, Stellenbosch Main, Golf Club, Jan Marais and Franschoek Substations will have insufficient capacity. Load growth at Watergang (Kayamandi residential), Groendal (Franschoek residential) and Kwarantyn (Stellenbosch commercial) will warrant the construction of one, or multiple, switching substations to distribute the total load requirements in these areas. Whilst at Engineering Faculty, Uniepark, Langstraat Suid and Hugenote the load will marginally exceed the current capacity by an extent that requires attention but does not warrant new substations.

A new, HV/MV substation will be required to unlock the expansion of the current Kayamandi area. The proximity of this development to the rural 66 kV Eskom feed makes the placement of a substation similar to the Cloeteville Substation in the area ideal. This Substation, initially deemed Kayamandi Substation, is envisaged to supply most of the consumers to the west of the R304.

The upgrade of Stellenbosch Main and Jan Marais Substation will constitute the replacement of current transformers to bigger units to increase the firm capacity. Upgrade to Cloeteville, Golf Club, Franschoek and further upgrades to Jan Marais Substations to be the addition of a third HV/MV transformer. New HV Switching Substations is proposed to cater for the loads at Kwarantyn, Langstraat Suid and Groendal, and cable upgrades to the balance of the overloaded substations.

The future network model was built in DIgSILENT PowerFactory® and used for further load flow studies and simulations. The network meets the loading requirements and provides N-1 redundancy at all substations<sup>13</sup>. The model was used to prepare network development timelines or schedules.

Land will be required for the new, HV/MV substation (Kayamandi) along with the new distribution substations which presumably will be included in the development plans.

A point of supply demand forecast has been prepared, including the new Kayamandi Substation point of supply, for assisting the Municipality in discussions with Eskom and to guide the notified maximum demand requirements. The Municipality is strongly encouraged to continue engaging with Eskom on a regular basis to ensure that Eskom's upstream infrastructure planning complements the Municipality's network development plans and strategy.

The condition assessment of the electrical infrastructure was limited to visual inspections, from the ground, under energised conditions. Overall the electrical assets appear in a good condition. RHDHV recommends the planned replacement of power transformers no later than 40 years after manufacture. This includes the transformers at Markotter Substation. More detailed transformer tests and analysis might indicate otherwise and such tests should be considered. The indoor 11 kV switchboards have gradually been replaced by the Municipality and RHDHV recommends that priority be given to replacing the remaining oil-filled switchgear.

RHDHV has made further recommendations which fall outside the scope of the master plan but have been included for information and inclusion in routine maintenance and adhoc, smaller projects. The main concern noted being the vermin and moisture sealing of substation rooms.

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<sup>13</sup> Note that redundancy is provided at all substations but that at Cloeteville and Franschoek no redundancy will be provided on the 66 kV supply to the substation.

To conclude, a number of promising developments have been planned which aim to promote economic growth and provide additional employment and formal housing within the municipal boundaries. The investment in the electrical infrastructure will enable this growth and take pressure off the Electrical Department to provide, and guarantee, a suitably secure and reliable supply of electricity to all consumers.

## 8. RECOMMENDATIONS

This section aims to provide a concise summary of the key recommendations made in this report in no specific order. For further details, refer to the executive summary or the main body of the report.

- i. Engage with Eskom to discuss the load forecast and future network development plans to ensure that upstream network planning is well aligned with the Municipality's objectives and strategy. The discussions will further provide the opportunity to discuss any network strengthening or upgrades that will be required to Eskom's network and the associated costs and project lead times.
- ii. Prepare for the new, HV/MV Kayamandi Substation. Allow sufficient lead time for these projects in order that suitable locations may be identified and compared to one another as part of the early phases of the design.
- iii. Plan for the upgrade and/or expansion of HV/MV transformation capacity at the Stellenbosch Main, Cloetesville, Golf Club, Jan Marais and Franschoek Substations.
- iv. Replace the older power transformers as they approach 40 years. In the interim, adhere to a strict programme of continual assessment and monitoring of the units, especially transformer oil purification and testing.
- v. Plan for a new Kwarentyn, Langstraat Suid and Groendal Substations.
- vi. Prepare the necessary motivations to secure capital budgets for the network developments. It would be advantageous if multi-year budget allocations could be motivated for the larger network developments.

Include the various small items identified during the condition assessment but falling outside the scope of the master plan, into routine maintenance or smaller projects. A number of fairly important, albeit small, items have been identified that should be addressed as soon as possible.

## 9. REFERENCES

Bloomberg, 2012. *FTSE/JSE Africa All Share Index*. [Online]  
Available at: <http://www.bloomberg.com/quote/JALSH:IND/chart>  
[Accessed 7 February 2012].

British Columbia Used Oil Management Association, 2007. *Recycling Council of British Columbia*. [Online]  
Available at: [http://www.rcbc.bc.ca/files/u3/ps\\_bcuomabrochure.pdf](http://www.rcbc.bc.ca/files/u3/ps_bcuomabrochure.pdf)

Engineering Council of South Africa, 2012. Guideline Scope of Services and Tariff of Fees for Persons Registered in terms of the Engineering Professions Act, 2000 (Act No. 46 of 2000). *Government Gazette*, pp. Vol. 558, No. 34875, 20 December 2011.

Eskom Distribution, 2010. *Specification for Large Power Transformers up to 132 kV, in the rating range 1.25 VMA to 160 MVA (Ref: DISSCAAD3, Rev 8)*, s.l.: Eskom Distribution.

Eskom, 2012. *Tariffs & Charges Booklet 2012/13*, Sandton: Eskom.

International Electrotechnical Commission, 2005. *Part 7: Loading guide for oil-immersed power transformers*, Switzerland: IEC 60076-7.

Maswanganyi, N., 2013. *Economy*. [Online]  
Available at: <http://www.bdlive.co.za/economy/2013/05/29/shock-gdp-slowdown-puts-rand-on-back-foot>  
[Accessed 30 05 2013].

South African Reserve Bank, 2009. *Monetary Policy*. [Online]  
Available at:  
<http://www.resbank.co.za/MonetaryPolicy/DecisionMaking/Pages/InflationMeasures.aspx>  
[Accessed 12 June 2013].

Standards South Africa, 2007. *Electricity distribution - Guidelines for the provision of electricity distribution networks in residential areas, Part 1: Planning and design of distribution networks (SANS 507-1:2007/NRS 034-1:2007)*, Pretoria: SANS.

StatsSA, 2012. *Census 2011 Municipal report*, Pretoria: Statistics South Africa.

Stellenbosch Municipality , 2014. *2015/15 Integrated Development Plan* , Stellenbosch: Stellenbosch Municipality.

Stellenbosch Municipality, 2014. *Stellenbosch Municipality Intergrated Development Plan 2013/14*, Stellenbosch: Stellenbosch Municipality.

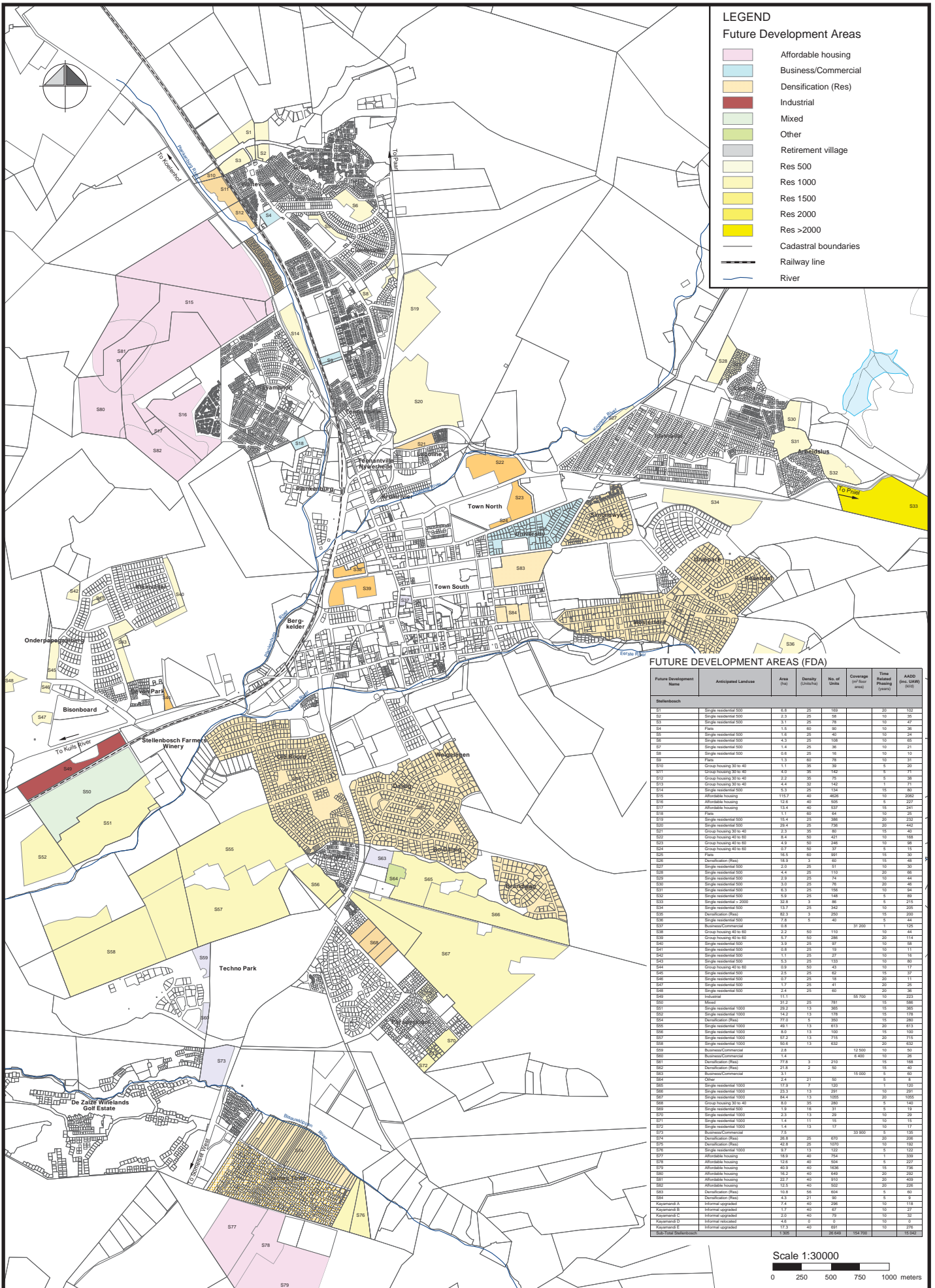
Trading Economics, 2013. *South Africa GDP Growth Rate*. [Online]  
Available at: <http://www.tradingeconomics.com/south-africa/gdp-growth>  
[Accessed 27 May 2013].

Trading Economics, 2013. *South Africa Inflation Rate*. [Online]  
Available at: <http://www.tradingeconomics.com/south-africa/inflation-cpi>  
[Accessed 12 June 2013].

van der Merwe, E., 2004. *Inflation targeting in South Africa*. [Online]  
Available at:  
[http://www.esaf.org/internet/Publication.nsf/LADV/E1BAD4FBC856AE9042256EF40046DEB/B/\\$File/OCCNo19.pdf](http://www.esaf.org/internet/Publication.nsf/LADV/E1BAD4FBC856AE9042256EF40046DEB/B/$File/OCCNo19.pdf)  
[Accessed 12 June 2013].



## APPENDIX A : DEVELOPMENT PLAN

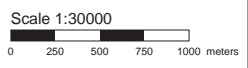


**LEGEND**  
Future Development Areas

- Affordable housing
- Business/Commercial
- Densification (Res)
- Industrial
- Mixed
- Other
- Retirement village
- Res 500
- Res 1000
- Res 1500
- Res 2000
- Res >2000
- Cadastral boundaries
- Railway line
- River

**FUTURE DEVELOPMENT AREAS (FDA)**

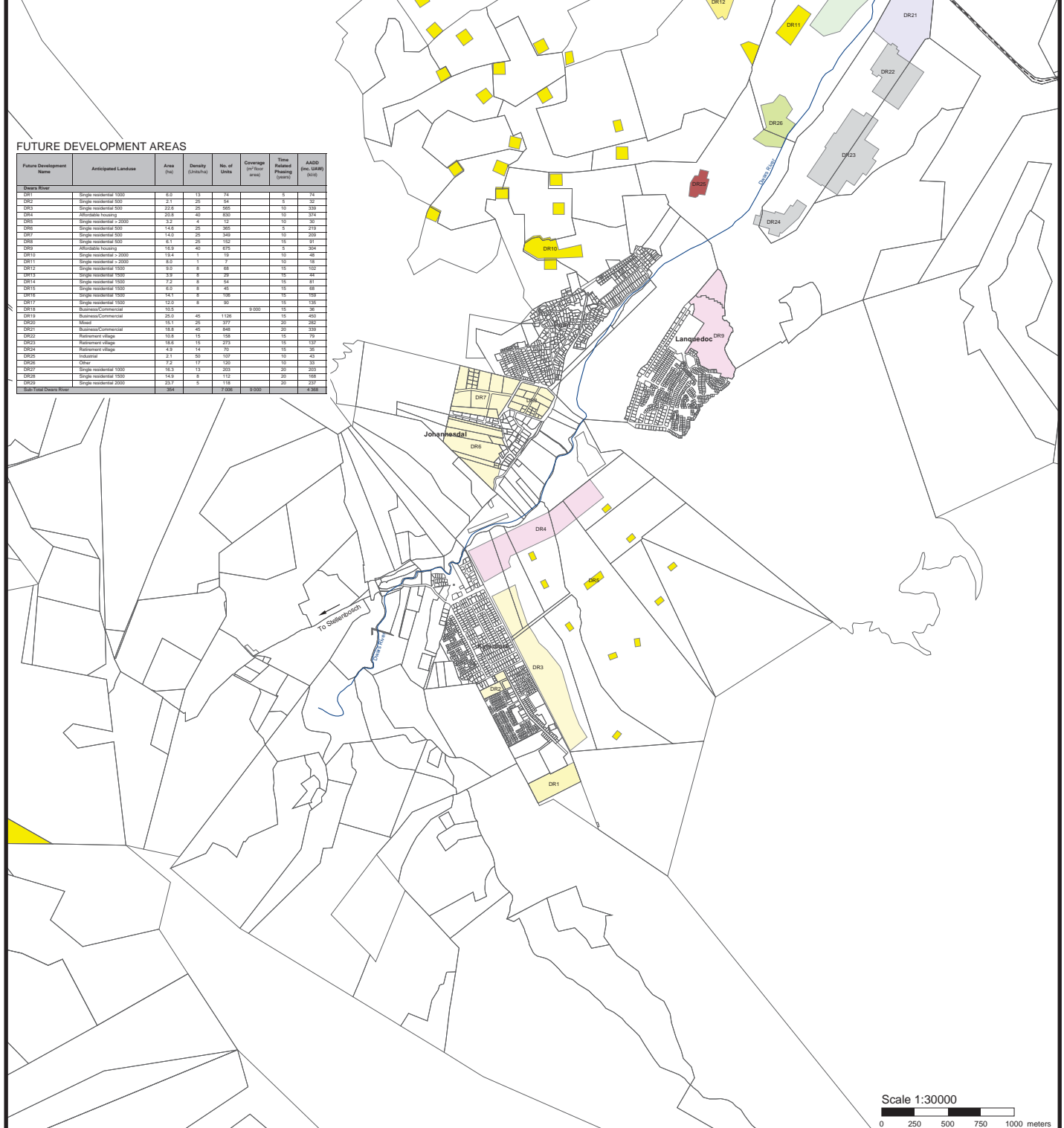
Future Development Name	Anticipated Land Use	Area (ha)	Density (Dw/ha)	No. of Units	Coverage (per floor area)	Total Raised Floor Area (m <sup>2</sup> )	AADD (lit. cap./ha)
S1	Single residential 500	8.8	25	150	20	100	100
S2	Single residential 500	2.3	25	58	10	29	29
S3	Single residential 500	2.1	25	53	10	27	27
S4	Flats	1.5	60	90	10	36	36
S5	Single residential 500	1.5	25	40	10	20	20
S6	Single residential 500	4.3	25	108	10	54	54
S7	Single residential 500	1.4	25	36	10	18	18
S8	Single residential 500	0.8	25	20	10	10	10
S9	Flats	1.3	60	78	10	31	31
S10	Single residential 50 to 60	1.1	30	33	5	17	17
S11	Flats	4.0	30	120	5	60	60
S12	Single residential 50 to 60	2.2	30	66	5	33	33
S13	Single residential 50 to 60	4.4	30	132	5	66	66
S14	Single residential 500	5.3	25	133	10	67	67
S15	Altenable housing	119.1	10	4626	10	2313	2313
S16	Altenable housing	12.6	40	505	5	252	252
S17	Altenable housing	13.8	40	552	5	276	276
S18	Flats	1.1	60	66	10	26	26
S19	Single residential 500	2.4	25	60	10	30	30
S20	Single residential 500	20.4	25	510	10	255	255
S21	Single residential 50 to 60	2.3	30	69	5	34	34
S22	Single residential 50 to 60	8.4	30	252	5	126	126
S23	Single residential 40 to 60	4.9	50	245	10	98	98
S24	Single residential 40 to 60	0.7	50	35	10	14	14
S25	Flats	18.5	60	930	10	465	465
S26	Altenable housing	18.2	10	688	10	344	344
S27	Single residential 500	2.0	25	50	10	25	25
S28	Single residential 500	4.4	25	110	10	55	55
S29	Single residential 500	2.5	25	63	10	31	31
S30	Single residential 500	3.0	25	75	10	38	38
S31	Single residential 500	8.3	25	208	10	104	104
S32	Single residential 500	5.9	25	148	10	74	74
S33	Single residential 2000	10.2	10	306	5	153	153
S34	Single residential 500	13.1	25	328	10	164	164
S35	Altenable housing	60.3	10	2291	10	1145	1145
S36	Altenable housing	4.0	10	140	5	70	70
S37	Business/Commercial	0.8	50	40	10	12	12
S38	Single residential 40 to 60	2.2	50	110	10	22	22
S39	Single residential 40 to 60	5.7	50	285	10	57	57
S40	Single residential 500	3.8	25	95	10	48	48
S41	Single residential 500	0.8	25	20	10	10	10
S42	Single residential 500	1.1	25	28	10	14	14
S43	Single residential 500	5.1	25	128	10	64	64
S44	Single residential 40 to 60	0.9	50	45	10	9	9
S45	Single residential 40 to 60	2.3	50	115	10	23	23
S46	Single residential 500	0.7	25	18	10	9	9
S47	Single residential 500	1.4	25	35	10	18	18
S48	Single residential 500	2.4	25	60	10	30	30
S49	Mixed	11.1	10	405	10	202	202
S50	Mixed	37.2	25	931	10	465	465
S51	Altenable housing	108	10	3960	10	1980	1980
S52	Altenable housing	14.2	10	505	10	252	252
S53	Altenable housing	14.2	10	505	10	252	252
S54	Altenable housing	77.0	10	2745	10	1372	1372
S55	Single residential 1000	48.1	10	1443	10	721	721
S56	Single residential 1000	80.0	10	2400	10	1200	1200
S57	Single residential 1000	39.2	10	1176	10	588	588
S58	Single residential 1000	50.0	10	1500	10	750	750
S59	Business/Commercial	2.8	10	84	10	42	42
S60	Business/Commercial	1.4	10	42	10	21	21
S61	Altenable housing	77.8	10	2708	10	1354	1354
S62	Altenable housing	2.4	10	84	10	42	42
S63	Business/Commercial	3.1	10	93	10	46	46
S64	Other	2.4	21	50	5	25	25
S65	Single residential 1000	17.0	10	510	10	255	255
S66	Single residential 1000	32.3	10	969	10	484	484
S67	Single residential 1000	34.4	10	1032	10	516	516
S68	Single residential 1000	8.0	10	240	10	120	120
S69	Single residential 1000	1.9	10	57	10	28	28
S70	Single residential 1000	2.3	10	69	10	34	34
S71	Single residential 1000	1.4	10	42	10	21	21
S72	Single residential 1000	1.4	10	42	10	21	21
S73	Business/Commercial	7.8	10	234	10	117	117
S74	Altenable housing	25.0	10	833	10	416	416
S75	Altenable housing	2.4	10	72	10	36	36
S76	Altenable housing	18.0	10	540	10	270	270
S77	Altenable housing	18.0	10	540	10	270	270
S78	Altenable housing	18.0	10	540	10	270	270
S79	Altenable housing	22.1	10	663	10	331	331
S80	Altenable housing	12.8	10	384	10	192	192
S81	Altenable housing	10.0	10	300	10	150	150
S82	Altenable housing	4.3	10	129	10	64	64
S83	Altenable housing	4.3	10	129	10	64	64
S84	Altenable housing	1.4	10	42	10	21	21
S85	Altenable housing	2.4	10	72	10	36	36
S86	Altenable housing	2.4	10	72	10	36	36
S87	Altenable housing	4.6	10	138	10	69	69
S88	Altenable housing	11.7	10	351	10	175	175
S89	Altenable housing	1.8	10	54	10	27	27
S90	Altenable housing	1.8	10	54	10	27	27
S91	Altenable housing	1.8	10	54	10	27	27
S92	Altenable housing	1.8	10	54	10	27	27
S93	Altenable housing	1.8	10	54	10	27	27
S94	Altenable housing	1.8	10	54	10	27	27
S95	Altenable housing	1.8	10	54	10	27	27
S96	Altenable housing	1.8	10	54	10	27	27
S97	Altenable housing	1.8	10	54	10	27	27
S98	Altenable housing	1.8	10	54	10	27	27
S99	Altenable housing	1.8	10	54	10	27	27
S100	Altenable housing	1.8	10	54	10	27	27



**Figure SW 4.1a**  
Potential future developments - Stellenbosch

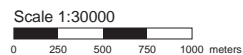
**LEGEND**  
Future Development Areas

- Affordable housing
- Business/Commercial
- Densification (Res)
- Industrial
- Mixed
- Other
- Retirement village
- Res 500
- Res 1000
- Res 1500
- Res 2000
- Res >2000
- Cadastral boundaries
- Railway line
- River



**FUTURE DEVELOPMENT AREAS**

Future Development Name	Anticipated Landuse	Area (ha)	Density (units/ha)	No. of Units	Coverage (of floor area)	Time Related Phasing (years)	AGSD (inc. UMR) (sqm)	
<b>Dwars River</b>								
DR1	Single residential 1000	8.0	13	74		5	74	
DR2	Single residential 500	27.1	25	544		5	32	
DR3	Single residential 500	22.6	25	505		10	102	
DR4	Affordable housing	20.8	40	830		10	174	
DR5	Single residential >2000	14.6	25	365		10	170	
DR6	Single residential 500	14.0	25	350		10	209	
DR7	Single residential 500	8.1	25	152		10	31	
DR8	Affordable housing	18.9	40	675		5	304	
DR9	Single residential >2000	8.8	1	17		10	48	
DR10	Single residential >2000	8.0	1	17		10	18	
DR11	Single residential 1000	9.0	8	48		10	102	
DR12	Single residential 1000	9.9	8	54		10	74	
DR13	Single residential 1000	7.0	8	34		10	51	
DR14	Single residential 1000	8.0	8	45		10	49	
DR15	Single residential 1000	14.1	8	106		10	159	
DR16	Single residential 1000	9.0	8	39		10	100	
DR17	Business/Commercial	10.5	40	1102		9-000	15	36
DR18	Business/Commercial	10.0	40	1102		10	402	
DR19	Mixed	10.1	20	277		20	282	
DR20	Business/Commercial	10.8	40	648		20	107	
DR21	Retirement village	18.8	15	108		10	79	
DR22	Retirement village	18.8	15	273		15	137	
DR23	Retirement village	14.9	14	90		10	35	
DR24	Industrial	21	50	1077		10	43	
DR25	Other	7.8	17	130		10	53	
DR26	Single residential 1000	18.3	13	233		20	233	
DR27	Single residential 1000	14.6	8	112		20	146	
DR28	Single residential 2000	23.7	5	115		20	237	
<b>Site Total Dwars River</b>		<b>304</b>		<b>7 036</b>		<b>9-000</b>	<b>4 368</b>	

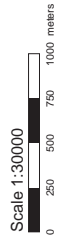
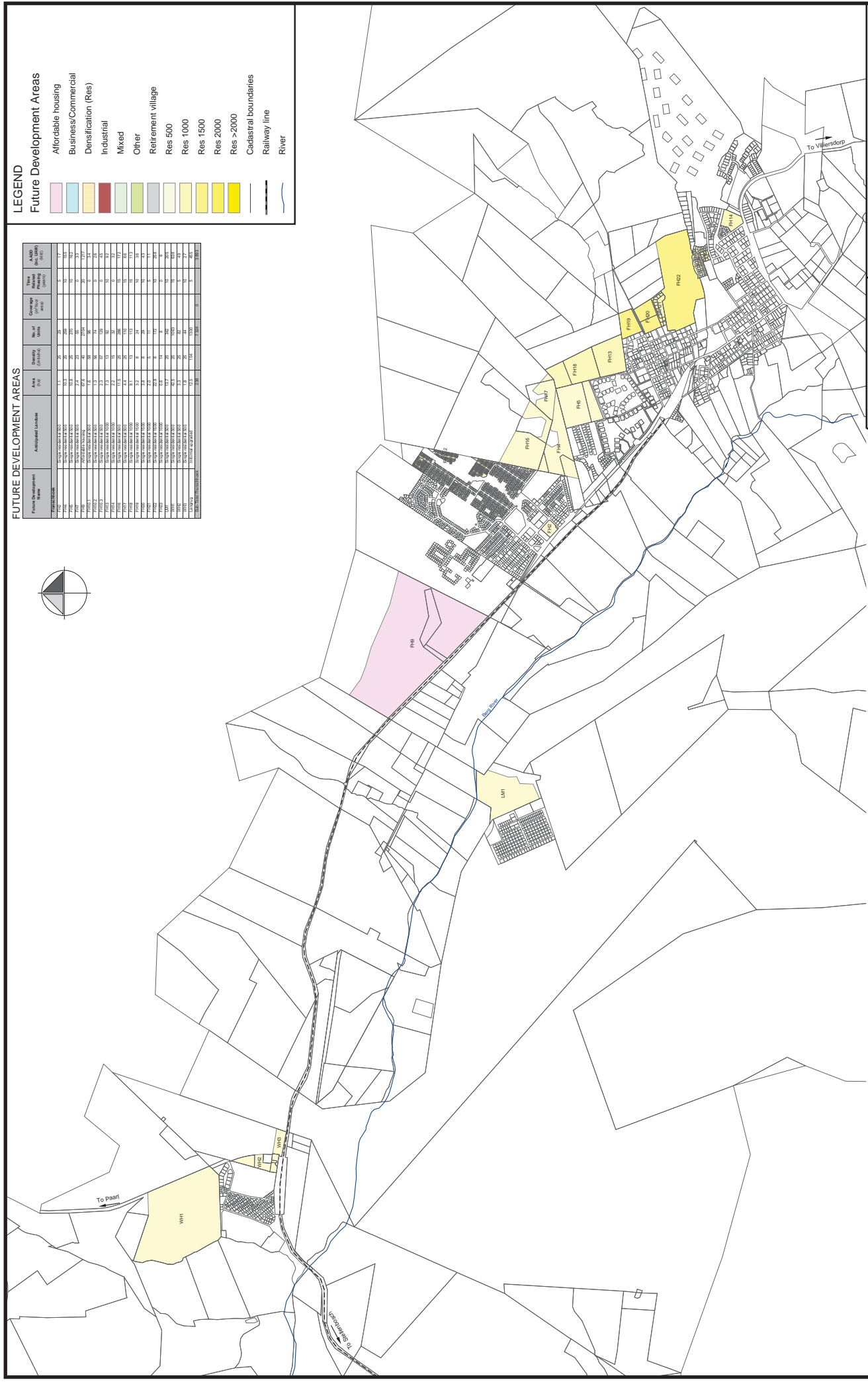


FUTURE DEVELOPMENT AREAS

Future Development Name	Anticipated Land Use	Area (Ha)	Density (Units/ha)	No. of Units	Coverage Level	Final Planned Density (Units/ha)	No. of Units
PH1	RESIDENTIAL (RES)	11.1	25	282	100%	10	100
PH2	RESIDENTIAL (RES)	13.3	25	332	100%	10	100
PH3	RESIDENTIAL (RES)	10.7	25	268	100%	10	100
PH4	RESIDENTIAL (RES)	7.0	25	175	100%	10	100
PH5	RESIDENTIAL (RES)	9.7	25	242	100%	10	100
PH6	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH7	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH8	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH9	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH10	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH11	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH12	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH13	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH14	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH15	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH16	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH17	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH18	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH19	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH20	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH21	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH22	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH23	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH24	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH25	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH26	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH27	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH28	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH29	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH30	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH31	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH32	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH33	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH34	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH35	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH36	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH37	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH38	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH39	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH40	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH41	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH42	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH43	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH44	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH45	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH46	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH47	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH48	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH49	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH50	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH51	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH52	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH53	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH54	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH55	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH56	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH57	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH58	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH59	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH60	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH61	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH62	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH63	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH64	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH65	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH66	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH67	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH68	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH69	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH70	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH71	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH72	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH73	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH74	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH75	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH76	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH77	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH78	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH79	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH80	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH81	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH82	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH83	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH84	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH85	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH86	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH87	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH88	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH89	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH90	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH91	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH92	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH93	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH94	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH95	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH96	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH97	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH98	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH99	RESIDENTIAL (RES)	11.3	25	282	100%	10	100
PH100	RESIDENTIAL (RES)	11.3	25	282	100%	10	100

LEGEND

- Future Development Areas**
- Affordable housing
  - Business/Commercial
  - Densification (Res)
  - Industrial
  - Mixed
  - Other
  - Retirement village
  - Res 500
  - Res 1000
  - Res 1500
  - Res 2000
  - Res >2000
  - Cadastral boundaries
  - Railway line
  - River



Scale 1:30000

Figure SW 4.1c  
Potential future developments -  
Franschhoek



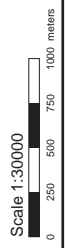
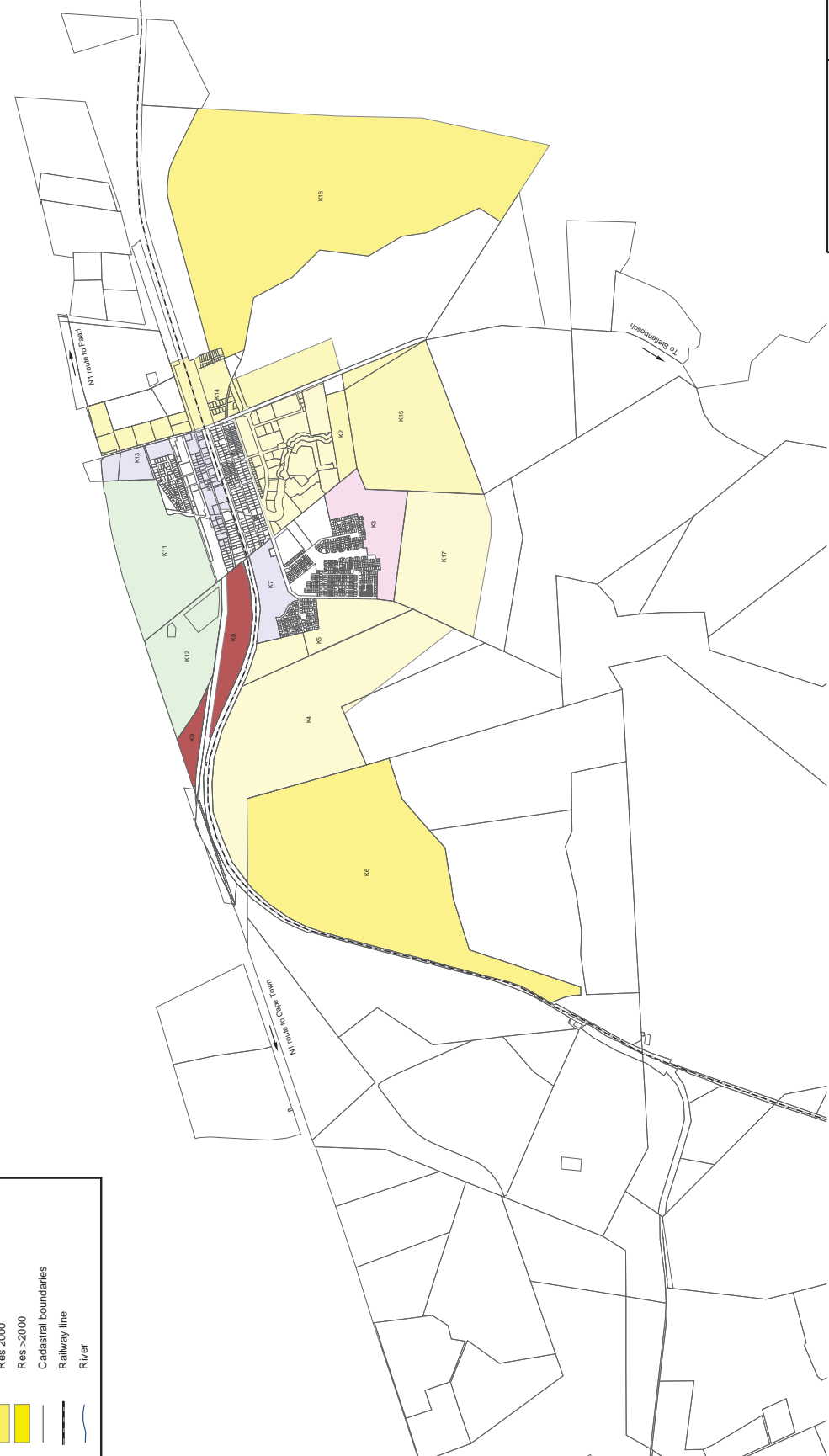
**LEGEND**

**Future Development Areas**

- Affordable housing
- Business/Commercial
- Densification (Res)
- Industrial
- Mixed
- Other
- Retirement village
- Res 500
- Res 1000
- Res 1500
- Res 2000
- Res >2000
- Cadastral boundaries
- Railway line
- River

**FUTURE DEVELOPMENT AREAS**

Development Name	Anticipated Location	Area (ha)	Density (Dwell./ha)	No. of Units	Change in pop. (2011-2021)	Area (ha)	Change in pop. (2011-2021)
RESIDENTIAL							
K1	WEST OF RIVER	1.2	200	240	100	1.2	100
K2	WEST OF RIVER	1.2	200	240	100	1.2	100
K3	WEST OF RIVER	1.2	200	240	100	1.2	100
K4	WEST OF RIVER	1.2	200	240	100	1.2	100
K5	WEST OF RIVER	1.2	200	240	100	1.2	100
K6	WEST OF RIVER	1.2	200	240	100	1.2	100
K7	WEST OF RIVER	1.2	200	240	100	1.2	100
K8	WEST OF RIVER	1.2	200	240	100	1.2	100
K9	WEST OF RIVER	1.2	200	240	100	1.2	100
K10	WEST OF RIVER	1.2	200	240	100	1.2	100
K11	WEST OF RIVER	1.2	200	240	100	1.2	100
K12	WEST OF RIVER	1.2	200	240	100	1.2	100
K13	WEST OF RIVER	1.2	200	240	100	1.2	100
K14	WEST OF RIVER	1.2	200	240	100	1.2	100
K15	WEST OF RIVER	1.2	200	240	100	1.2	100
K16	WEST OF RIVER	1.2	200	240	100	1.2	100
K17	WEST OF RIVER	1.2	200	240	100	1.2	100
K18	WEST OF RIVER	1.2	200	240	100	1.2	100
K19	WEST OF RIVER	1.2	200	240	100	1.2	100
K20	WEST OF RIVER	1.2	200	240	100	1.2	100
K21	WEST OF RIVER	1.2	200	240	100	1.2	100
K22	WEST OF RIVER	1.2	200	240	100	1.2	100
K23	WEST OF RIVER	1.2	200	240	100	1.2	100
K24	WEST OF RIVER	1.2	200	240	100	1.2	100
K25	WEST OF RIVER	1.2	200	240	100	1.2	100
K26	WEST OF RIVER	1.2	200	240	100	1.2	100
K27	WEST OF RIVER	1.2	200	240	100	1.2	100
K28	WEST OF RIVER	1.2	200	240	100	1.2	100
K29	WEST OF RIVER	1.2	200	240	100	1.2	100
K30	WEST OF RIVER	1.2	200	240	100	1.2	100
K31	WEST OF RIVER	1.2	200	240	100	1.2	100
K32	WEST OF RIVER	1.2	200	240	100	1.2	100
K33	WEST OF RIVER	1.2	200	240	100	1.2	100
K34	WEST OF RIVER	1.2	200	240	100	1.2	100
K35	WEST OF RIVER	1.2	200	240	100	1.2	100
K36	WEST OF RIVER	1.2	200	240	100	1.2	100
K37	WEST OF RIVER	1.2	200	240	100	1.2	100
K38	WEST OF RIVER	1.2	200	240	100	1.2	100
K39	WEST OF RIVER	1.2	200	240	100	1.2	100
K40	WEST OF RIVER	1.2	200	240	100	1.2	100
K41	WEST OF RIVER	1.2	200	240	100	1.2	100
K42	WEST OF RIVER	1.2	200	240	100	1.2	100
K43	WEST OF RIVER	1.2	200	240	100	1.2	100
K44	WEST OF RIVER	1.2	200	240	100	1.2	100
K45	WEST OF RIVER	1.2	200	240	100	1.2	100
K46	WEST OF RIVER	1.2	200	240 </tr			



**Figure SW 4.1d**  
Potential future developments - Klapmuts



**PROPOSED EXPANSION RECEIVED FROM UNIVERSITY OF STELLENBOSCH  
FOR THE 20 YEAR FORECAST**

11kV Supply	Existing Nominated Max Demand (KVA)	New Nominated Max Demand (KVA)
Biologie (JC Smuts)	1 000	1 500
BJ Voster (Lettere)	2 000	2 000
DF Malan (Schuman)	1 000	1 500
Erica	2 000	2 000
Helderberg	500	500
Ingenieurs	4 000	4 500
Instandhouding	1 000	2 000
Konservatorium	1 000	2 000
Monica	1 000	1 500
Neelsie (LSS)	4 000	5 000
Simonsberg	1 500	2 500
Welgevallen	1 000	2 000
Coetzenburg	1 000	3 000
<b>TOTAL</b>	<b>21 000</b>	<b>30 000</b>

## **APPENDIX B : LIST OF FUTURE DEVELOPMENTS & ASSOCIATED LOADS**



Map Ref	Supply Station	Notes	Planned Housing Numbers												Total Units	ADAD (kVA)	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L16	L17	L18	L19	L20	L21	L22	L23	L24	L25	L26	L27	L28	L29	L30	L31	L32	L33	L34	L35	L36	L37	L38	L39	L40	L41	L42	L43	L44	L45	L46	L47	L48	L49	L50	L51	L52	L53	L54	L55	L56	L57	L58	L59	L60	L61	L62	L63	L64	L65	L66	L67	L68	L69	L70	L71	L72	L73	L74	L75	L76	L77	L78	L79	L80	L81	L82	L83	L84	L85	L86	L87	L88	L89	L90	L91	L92	L93	L94	L95	L96	L97	L98	L99	L100	L101	L102	L103	L104	L105	L106	L107	L108	L109	L110	L111	L112	L113	L114	L115	L116	L117	L118	L119	L120	L121	L122	L123	L124	L125	L126	L127	L128	L129	L130	L131	L132	L133	L134	L135	L136	L137	L138	L139	L140	L141	L142	L143	L144	L145	L146	L147	L148	L149	L150	L151	L152	L153	L154	L155	L156	L157	L158	L159	L160	L161	L162	L163	L164	L165	L166	L167	L168	L169	L170	L171	L172	L173	L174	L175	L176	L177	L178	L179	L180	L181	L182	L183	L184	L185	L186	L187	L188	L189	L190	L191	L192	L193	L194	L195	L196	L197	L198	L199	L200	L201	L202	L203	L204	L205	L206	L207	L208	L209	L210	L211	L212	L213	L214	L215	L216	L217	L218	L219	L220	L221	L222	L223	L224	L225	L226	L227	L228	L229	L230	L231	L232	L233	L234	L235	L236	L237	L238	L239	L240	L241	L242	L243	L244	L245	L246	L247	L248	L249	L250	L251	L252	L253	L254	L255	L256	L257	L258	L259	L260	L261	L262	L263	L264	L265	L266	L267	L268	L269	L270	L271	L272	L273	L274	L275	L276	L277	L278	L279	L280	L281	L282	L283	L284	L285	L286	L287	L288	L289	L290	L291	L292	L293	L294	L295	L296	L297	L298	L299	L300	L301	L302	L303	L304	L305	L306	L307	L308	L309	L310	L311	L312	L313	L314	L315	L316	L317	L318	L319	L320	L321	L322	L323	L324	L325	L326	L327	L328	L329	L330	L331	L332	L333	L334	L335	L336	L337	L338	L339	L340	L341	L342	L343	L344	L345	L346	L347	L348	L349	L350	L351	L352	L353	L354	L355	L356	L357	L358	L359	L360	L361	L362	L363	L364	L365	L366	L367	L368	L369	L370	L371	L372	L373	L374	L375	L376	L377	L378	L379	L380	L381	L382	L383	L384	L385	L386	L387	L388	L389	L390	L391	L392	L393	L394	L395	L396	L397	L398	L399	L400	L401	L402	L403	L404	L405	L406	L407	L408	L409	L410	L411	L412	L413	L414	L415	L416	L417	L418	L419	L420	L421	L422	L423	L424	L425	L426	L427	L428	L429	L430	L431	L432	L433	L434	L435	L436	L437	L438	L439	L440	L441	L442	L443	L444	L445	L446	L447	L448	L449	L450	L451	L452	L453	L454	L455	L456	L457	L458	L459	L460	L461	L462	L463	L464	L465	L466	L467	L468	L469	L470	L471	L472	L473	L474	L475	L476	L477	L478	L479	L480	L481	L482	L483	L484	L485	L486	L487	L488	L489	L490	L491	L492	L493	L494	L495	L496	L497	L498	L499	L500	L501	L502	L503	L504	L505	L506	L507	L508	L509	L510	L511	L512	L513	L514	L515	L516	L517	L518	L519	L520	L521	L522	L523	L524	L525	L526	L527	L528	L529	L530	L531	L532	L533	L534	L535	L536	L537	L538	L539	L540	L541	L542	L543	L544	L545	L546	L547	L548	L549	L550	L551	L552	L553	L554	L555	L556	L557	L558	L559	L560	L561	L562	L563	L564	L565	L566	L567	L568	L569	L570	L571	L572	L573	L574	L575	L576	L577	L578	L579	L580	L581	L582	L583	L584	L585	L586	L587	L588	L589	L590	L591	L592	L593	L594	L595	L596	L597	L598	L599	L600	L601	L602	L603	L604	L605	L606	L607	L608	L609	L610	L611	L612	L613	L614	L615	L616	L617	L618	L619	L620	L621	L622	L623	L624	L625	L626	L627	L628	L629	L630	L631	L632	L633	L634	L635	L636	L637	L638	L639	L640	L641	L642	L643	L644	L645	L646	L647	L648	L649	L650	L651	L652	L653	L654	L655	L656	L657	L658	L659	L660	L661	L662	L663	L664	L665	L666	L667	L668	L669	L670	L671	L672	L673	L674	L675	L676	L677	L678	L679	L680	L681	L682	L683	L684	L685	L686	L687	L688	L689	L690	L691	L692	L693	L694	L695	L696	L697	L698	L699	L700	L701	L702	L703	L704	L705	L706	L707	L708	L709	L710	L711	L712	L713	L714	L715	L716	L717	L718	L719	L720	L721	L722	L723	L724	L725	L726	L727	L728	L729	L730	L731	L732	L733	L734	L735	L736	L737	L738	L739	L740	L741	L742	L743	L744	L745	L746	L747	L748	L749	L750	L751	L752	L753	L754	L755	L756	L757	L758	L759	L760	L761	L762	L763	L764	L765	L766	L767	L768	L769	L770	L771	L772	L773	L774	L775	L776	L777	L778	L779	L780	L781	L782	L783	L784	L785	L786	L787	L788	L789	L790	L791	L792	L793	L794	L795	L796	L797	L798	L799	L800	L801	L802	L803	L804	L805	L806	L807	L808	L809	L810	L811	L812	L813	L814	L815	L816	L817	L818	L819	L820	L821	L822	L823	L824	L825	L826	L827	L828	L829	L830	L831	L832	L833	L834	L835	L836	L837	L838	L839	L840	L841	L842	L843	L844	L845	L846	L847	L848	L849	L850	L851	L852	L853	L854	L855	L856	L857	L858	L859	L860	L861	L862	L863	L864	L865	L866	L867	L868	L869	L870	L871	L872	L873	L874	L875	L876	L877	L878	L879	L880	L881	L882	L883	L884	L885	L886	L887	L888	L889	L890	L891	L892	L893	L894	L895	L896	L897	L898	L899	L900	L901	L902	L903	L904	L905	L906	L907	L908	L909	L910	L911	L912	L913	L914	L915	L916	L917	L918	L919	L920	L921	L922	L923	L924	L925	L926	L927	L928	L929	L930	L931	L932	L933	L934	L935	L936	L937	L938	L939	L940	L941
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## APPENDIX C : CONDITION ASSESMENT SHEETS

STELLENBOSCH CONDITION ASSESSMENT - SUBSTATION SUMMARY TABLE

Substation Name	OUTDOOR HV YARD					INDOOR HV CONTROL ROOM					INDOOR MV SWITCHROOM												
	Trench cover - Acceptable or Not	Yard - Erosion, Vegetation, Good	Transformer - Discolouring, Rust, Bird Nest, Oil leakage, Good	Transformer - Year of Manufacture	Corrosion: outdoor steelwork - Not Visible, Minor surface, Severe	Trench cover - Acceptable or Not	House Keeping - Good or Bad	Relays	Type	Manufacturer	Trench cover - Acceptable or Not	House Keeping - Good or Bad	Verm and Water Protection - Acceptable or Not	Fire Extinguisher - Available or Not Available, Condition Good	Battery Tripping Unit - Condition Good or Bad, Electrolyte levels (Below Minimum)	Type	Manufacturer	Year	Interrupting Medium - Oil, SF6, Vacuum	Switchgear - Acceptable or Not	Type	Relays	Available or Not
1. Jan Marais	-	G	G	1979 (T1 & T2)	No	Acc	B	NA20MM000	Thytronic	Acc	B	Acc	Av, B	G	LMT/X31/QM	Reyrolle	Not Av	O	Acc	NA10MM000	Thytronic	Not Av	Available
2. Unispark	-	-	-	-	-	Ml	B	-	-	Ml	B	Acc	Av, G	G	Safepus V	ABB	2011	SF6	Acc	-	-	Not Av	Not Av
3. Karindal	-	-	-	-	-	Ml	B	-	-	Ml	B	Not Acc	Av, G	G	Safepus V	ABB	2013	SF6	Acc	-	-	Not Av	Not Av
4. Bosman	-	-	-	-	-	Ml	B	-	-	Ml	B	Acc	Av, G	G	LMS/X2/QM; JS/X1/JO	Reyrolle	1976;1955	O	Not Acc	-	-	Not Av	Not Av
5. Suidwal	-	-	-	-	-	Acc	G	-	-	Acc	G	Acc	Av, G	G	BD4	ABB	2011	SF6	Acc	-	-	Not Av	Not Av
6. Maricoer	-	G	G	1971(T1) 1973 (T3)	No	Ml	B	SELB87LSEL351A	Schweitzer Eng. Labh	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7. Helshoogte	-	-	-	-	-	Acc	B	-	-	Acc	B	Acc	Av, G	G	Safepus V	ABB	2013	SF6	Acc	REJ603	ABB	Not Av	Not Av
8. Marais Park	-	-	-	-	-	Ml	G	-	-	Ml	G	Acc	Av, G	G	Safepus V	ABB	2011	SF6	Acc	-	-	Not Av	Not Av
9. Sonneblom	-	-	-	-	-	Ml, Not Acc	B	-	-	Ml, Not Acc	B	Acc	Av, G	G	Safepus V	ABB	2014	SF6	Acc	-	-	Not Av	Not Av
10. Stone	-	-	-	-	-	Not Acc	B	-	-	Not Acc	B	Not Acc	Av, G	G	LMS/X2/QM	Reyrolle-England; Long & Crawford	Not Av	O	Acc	FP04	Strike Technologies	Not Av	Not Av
11. Tindal	-	-	-	-	-	Ml	G	-	-	Ml	G	Acc	Av, B	-	J4	Reyrolle-England; Long & Crawford	-	O	Acc	FP04; Strike Technologies; 351A; SPAJ140C;	Strike Technologies; SEL; Reyrolle	Not Av	Not Av
12. University	-	G	Bl	1978 (T1) 1978 (T2) - (T3)	Min	Acc	B	-	Reyrolle	Acc	B	Acc	Av, G	G	LMS/X2/QM; VDALMT	ABB	Not Av	O	Acc	-	-	Not Av	Not Av
13. Tonaant	-	-	-	-	-	Ml	G	-	-	Ml	G	Acc	Av, G	G	LMS/X2/QM	Reyrolle Parsons	1955	O	Acc	-	-	Not Av	Not Av
14. Infratec / Drogbaan	-	-	-	-	-	Acc	G	-	-	Acc	G	Acc	Av, G	G	T1; T1; OF	GEC Power Distribution	1988	O	Acc	-	-	Not Av	Not Av
15. Canniere	-	-	-	-	-	Ml	G	-	-	Ml	G	Acc	Av, G	G	T1; OF	GEC Power Distribution	1987	O	Acc	CDG	-	Not Av	Not Av
16. Helderfontein	-	-	-	-	-	Not Acc, Ml	G	-	-	Not Acc, Ml	G	Acc	Av, G	G	LMS/X2/QM; LMS/X1/QM; L; M; X2/QM; LMS/X1/QM; T3GF3	Reyrolle; Long & Crawford Reyrolle	1976;1987,11 967;1976; 1955	O	Acc	-	-	Not Av	Not Av
17. Curry	-	-	-	-	-	Ml	B	-	-	Ml	B	Not Acc	Av, G	G	LMS/X1/QM	Alstom	1987	O	Acc	-	-	Not Av	Not Av
18. Cloetesville	-	G	Oille	-	No	Acc	B	SP7; SPA115C	SEL; ABB	Acc	B	Acc	Av, G	G	SBV4/800/25;1; K1M4F	ABB	2000	Va	Acc	551A	SEL	Not Av	Not Av
19. Welgevonden	-	-	-	-	-	Acc	G	-	-	Acc	G	Acc	Av, G	G	LMS/X2/QMRO	Reyrolle	1987	O	Acc	-	-	Not Av	Not Av
20. Rhode	-	-	-	-	-	Ml	G	-	-	Ml	G	Acc	Av, G	G	JS/X1/JO	Reyrolle	1955	O	Not Acc	-	-	Not Av	Not Av
21. Fir	-	-	-	-	-	Ml	G	-	-	Ml	G	Acc	Av, G	G	JS/X1/JO	Reyrolle	1955	O	Not Acc	-	-	Not Av	Not Av
22. Langer Suid	-	-	-	-	-	Ml	B	-	-	Ml	B	Acc	Av, G	G	Safepus V	ABB	2011	SF6	Acc	-	-	Not Av	Not Av
23. Kayamandi	-	-	-	-	-	Ml	B	-	-	Ml	B	Acc	Av, G	G	VDALMT	ABB	Not Av	Va	Acc	-	-	Not Av	Not Av
24. Watergang	-	-	-	-	-	Acc	B	-	-	Acc	B	Acc	Av, G	G	TAMCO	ABB	Not Av	O	Acc	-	-	Not Av	Not Av
25. Simonswik	-	-	-	-	-	Ml	B	-	-	Ml	B	Acc	Av, B	G	ROKSS/CC	Reyrolle	Not Av	O	Not Acc	-	-	Not Av	Not Av
26. Sontswale	-	-	-	-	-	Ml	B	-	-	Ml	B	Acc	Av, G	G	T3GF3 RMLU	Long & Crawford	Not Av	O	Not Acc	-	-	Not Av	Not Av
27. Meriman Z	-	-	-	-	-	Ml	B	-	-	Ml	B	Acc	Av, G	G	VDALMT	ABB	-	SF6	Acc	-	-	Not Av	Not Av
28. Meriman Bld	-	-	-	-	-	Acc	G	-	-	Acc	G	Acc	Av, G	G	IS/X2/JO	Reyrolle-England	1955	O	Acc	-	-	Not Av	Not Av
29. Dennisord	-	-	-	-	-	Ml	B	-	-	Ml	B	Not Acc	Av, G	G	IS/X2/JO	Reyrolle-England	1956	O	Acc	-	-	Not Av	Not Av
30. Waterkant	-	-	-	-	-	Ml	B	-	-	Ml	B	Acc	Av, G	G	T3GF3	Long & Crawford	1955	O	Acc	-	-	Not Av	Not Av
31. Gymnasium	-	-	-	-	-	Acc	G	-	-	Acc	G	Acc	Av, G	G	JS/X2/JO;	Reyrolle-England	1955;	O	Not Acc	-	-	Not Av	Not Av
32. Welgevallen	-	-	-	-	-	Ml	B	-	-	Ml	B	Not Acc	Av, B	G	Safepus V	ABB	2011	SF6	Acc	-	-	Not Av	Not Av
33. Coetzenberg	-	-	-	-	-	Ml	G	-	-	Ml	G	Acc	Av, G & B	G	LMS/X2/DE; VDALMT; JS/X1/JO	Reyrolle Parsons; ABB; Reyrolle-England	1955; 1955; 1955	O; SF6; O	Acc	-	-	Not Av	Not Av
34. Zambesi	-	-	-	-	-	Acc	B	-	-	Acc	B	Acc	Av, G	G	T3GF3 RMLU	Long & Crawford	1967	O	Not Acc	-	-	Not Av	Not Av
35. Hofman	-	-	-	-	-	Acc	B & G	-	-	Acc	B & G	Acc	Av, G	G	Safepus V; Sv; Sv6F	ABB	2013	SF6	Acc	-	-	Not Av	Not Av
36. Blakes Estate	-	-	-	-	-	Ml	B	-	-	Ml	B	Not Acc	Av, G	G	Safepus V	ABB	2009	SF6	Acc	-	-	Not Av	Not Av
37. Lower Dorp	-	-	-	-	-	Ml	G	-	-	Ml	G	Not Acc	Av, G	G	LMS/X2/QM	Reyrolle Parsons	1976	O	Not Acc	-	-	Not Av	Not Av
38. Distell	-	-	-	-	-	Acc	G	-	-	Acc	G	Acc	Av, G	G	Safepus V; Safepus Sibe	ABB	2009;2010	SF6	Acc	-	-	Not Av	Not Av
39. Bergaaphass / Cemetery	-	-	-	-	-	Not Acc	B	-	-	Not Acc	B	Acc	Av, G	G	Safepus V; Safepus S1	ABB	2011	SF6	Acc	-	-	Not Av	Not Av
40. Torvaldalf	-	-	-	-	-	Ml & Not Acc	B	-	-	Ml & Not Acc	B	Not Acc	Av, G	G	Safepus V	ABB	2011	SF6	Acc	-	-	Not Av	Not Av
41. Mondl	-	-	-	-	-	Not Acc	B	-	-	Not Acc	B	Acc	Av, B	G	OSA	Yorkshire Switchgear	1990	O	Not Acc	-	-	Not Av	Not Av
42. Devon Valley	-	-	-	-	-	Ml & Not Acc	B	-	-	Ml & Not Acc	B	Not Acc	Av, G	G	LMS/X2/QM; JS/X2/JO; JS/X2/JO	Reyrolle Parsons	1976; 1955; 1952	O	Not Acc	-	-	Not Av	Not Av
43. Main	Acc	G	Rig, Oille	1971	Min	Acc	G	-	-	Acc	G	Acc	Av, G	G	JS/X2/JO	Reyrolle Parsons	1955	O	Acc	-	-	Not Av	Not Av
44. Industry	-	-	-	-	-	Acc	G	-	-	Acc	G	Acc	Av, G	G	JS/X1/JO	Reyrolle Parsons	1955	O	Not Acc	-	-	Not Av	Not Av
45. Polkadraai	-	-	-	-	-	Ml	B	-	-	Ml	B	Not Acc	Av, G	G	JS/X1/JO	Reyrolle Parsons	1955	O	Not Acc	-	-	Not Av	Not Av
46. Medi-Clinic	-	-	-	-	-	Acc	G	-	-	Acc	G	Acc	Av, G	G	LMS/X2/QM	Reyrolle Parsons	1976	O	Acc	-	-	Not Av	Not Av
47. Boord	-	-	-	-	-	Acc	G	-	-	Acc	G	Acc	Av, G	G	LMS/X2/QM	Reyrolle Parsons	1976	O	Acc	-	-	Not Av	Not Av

Substation Name	OUTDOOR HV YARD				INDOOR HV CONTROL ROOM				INDOOR MV SWITCHROOM																
	Trench cover - Acceptable or Not Acceptable, Missing	Yard - Erosion, Vegetation, Good	Transformer - Discolouring, Rust, Bird Nests, Oil leakage, Good	Transformer - Year of Manufacture	Corrosion: outdoor steelwork - Not Visible, Minor surface, Severe	Trench cover - Acceptable or Not Acceptable, Missing	House Keeping - Good or Bad	Relays	Manufacturer	Type	Switchgear	Year	Interrupting Medium - Oil, SF6, Vacuum	Switchgear - Acceptable or Not Acceptable, Obsolete	Type	Relays	Manufacturer	ARC Protection - Available or Not Available							
48. Stellenbosch Golf Club	Acc	G	Ru	1987	Min	Acc	G	SEL3877L&SEL351A	Schweitzer Eng. Labs		Acc	G	Acc	Av, G	Fire Extinguisher - Available or Not Available, Condition (Good or Bad)	Battery Tripping Unit - Condition (Good or Bad), Electrolyte levels (Below Minimum)	Type	Manufacturer	Year	Interrupting Medium - Oil, SF6, Vacuum	Switchgear - Acceptable or Not Acceptable, Obsolete	Type	Relays	Manufacturer	ARC Protection - Available or Not Available
49. Paradysooif	-	-	-	-	-	Acc	G	-	-	Acc	G	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	LMR/X1/QM; IMS/X2/QE	ABB	1987; 1985; 1995	0	Not Acc	-	Not Acc	Not AV
50. Blaaukloof	-	-	-	-	-	Acc	G	-	-	Acc	G	Acc	Av, G&B	Av, G	Not Available, Condition (Good or Bad)	-	-	X1	Hawker Siderly	1995	0	Not Acc	-	Not Acc	Not AV
51. Techno Park	-	-	-	-	-	Ml	G	-	-	Ml	G	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	HD4/W/17.12.32; LMR/X1/QM; LMS/X1/QM	ABB; Reyrolle; Reyrolle Parsons	1976; 1987	SF6; O;	Acc	-	-	Not AV
52. Capital Place	-	-	-	-	-	Ml	B	-	-	Ml	B	Not Acc	-	-	Not Available, Condition (Good or Bad)	-	-	FBX-C17-20/C-C12	ABB	2003	SF6	Acc	-	-	Not AV
53. Data Voice	-	-	-	-	-	Acc	B	-	-	Acc	B	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	T3/OF	GEC Power Distribution	1987	0	Not Acc	-	-	Not AV
54. Schumann	-	-	-	-	-	Not Acc	G	-	-	Not Acc	G	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	J4; GF3	Long & Crawford	1995	0	Not Acc	-	-	Not AV
55. Neelise	-	-	-	-	-	Acc	G	-	-	Acc	G	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	Safepus V	ABB	2013	SF6	Acc	-	-	AV
56. Monica	-	-	-	-	-	Ml	G	-	-	Ml	G	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	JS/X1/Q	Reyrolle-England	1995	0	Not Acc	-	-	Not AV
57. Mambou	-	-	-	-	-	Ml	G	-	-	Ml	G	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	Type T/8806	Yorkshire Switchgear	-	0	Acc	-	-	Not AV
58. SA Perm	-	-	-	-	-	Ml	G	-	-	Ml	G	Acc	Av, B	Av, B	Not Available, Condition (Good or Bad)	-	-	JS/X1/Q	Reyrolle-England	1955	0	Not Acc	-	-	Not AV
59. Stadsaal	-	-	-	-	-	Not Acc	G	-	-	Not Acc	G	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	HD4-LMT; LMS/X2/QM	ABB;	-	SF6;	Acc	-	-	Not AV
60. Drama	-	-	-	-	-	Ml	B	-	-	Ml	B	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	JS/X1/Q; JK/X3/QM	Reyrolle-England	1955	0	Not Acc	-	-	Not AV
61. Braak	-	-	-	-	-	Ml	B	-	-	Ml	B	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	LMT2/X31/QM; LMS/X2/QE	Reyrolle Parsons	1976;	0	Acc	-	-	Not AV
62. Meuplein	-	-	-	-	-	Ml	B	-	-	Ml	B	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	JS/X1/Q	Reyrolle-England	1995	0	Acc	-	-	Not AV
63. Kerk	-	-	-	-	-	Ml	G	-	-	Ml	G	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	LMS/X2/QE	Reyrolle Parsons	1955	0	Not Acc	-	-	Not AV
64. Korb	-	-	-	-	-	Ml	G	-	-	Ml	G	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	JS/X1/Q; JK/X3/Q	Reyrolle-England	1955	0	Not Acc	-	-	Not AV
65. Waterwegen	-	-	-	-	-	Ml	G	-	-	Ml	G	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	JS/X1/Q; JK/X3/QM	Reyrolle-England	1985	0	Not Acc	-	-	Not AV
66. Dabigbos	-	-	-	-	-	Ml	G	-	-	Ml	G	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	Safepus V	ABB	2009	SF6	Acc	-	-	Not AV
67. Dasing Weg	-	-	-	-	-	Ml	B	-	-	Ml	B	Acc	Not AV	Not AV	Not Available, Condition (Good or Bad)	-	-	T3/OF	Long & Crawford	1995	0	Not Acc	-	-	Not AV
68. Brandwacht	-	-	-	-	-	Acc	G	-	-	Acc	G	Acc	Av, Not Legible	Av, Not Legible	Not Available, Condition (Good or Bad)	-	-	JK/X2/QM & JS/X1/Q	Reyrolle-England	1995	0	Not Acc	-	-	Not AV
69. Krige	-	-	-	-	-	Ml	B	-	-	Ml	B	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	GF3; J4; J3	Long & Crawford	1955; 1967	0	Not Acc	-	-	Not AV
70. Pappagaarind	-	-	-	-	-	Ml	B	-	-	Ml	B	Acc	Av, Not Legible	Av, Not Legible	Not Available, Condition (Good or Bad)	-	-	LMT2/X31/QM; LMS/X2/QM; JS/X1/Q; JK/X3/Q	Reyrolle-England	1952; 1955	0	Not Acc	-	-	Not AV
71. Vruitepakkers	-	-	-	-	-	Ml	B	-	-	Ml	B	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	T1/OF	GEC Power Distribution	1988	0	Not Acc	-	-	Not AV
72. La Coline	-	-	-	-	-	Ml	G	-	-	Ml	G	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	Safepus V	ABB	2011	SF6	Acc	-	-	Not AV
73. Cascade	-	-	-	-	-	Ml	G	-	-	Ml	G	Acc	Not AV	Not AV	Not Available, Condition (Good or Bad)	-	-	LMS/X2/QM; LMS/X2/QE	Reyrolle Parsons;	1976;	0	Acc	-	-	Not AV
74. Adelingstraat	-	-	-	-	-	Acc	B	-	-	Acc	B	Acc	Av, B	Av, B	Not Available, Condition (Good or Bad)	-	-	TGF3RMU	Long & Crawford	1955	0	Acc	-	-	Not AV
75. Adelingstraat Kliniek	-	-	-	-	-	Ml	B	-	-	Ml	B	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	JS/X1/Q	Reyrolle-England	1955	0	Acc	-	-	Not AV
76. Bl Voster	-	-	-	-	-	Acc	B	-	-	Acc	B	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	ROK Fuse Switch & RO5/X1	Reyrolle-England	-	0	Acc	-	-	Not AV
77. Twaas Rake	-	-	-	-	-	Ml	G	-	-	Ml	G	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	ONESS GEAR	Reyrolle-England	-	0	Acc	-	-	Not AV
78. Du Toit	-	-	-	-	-	Ml	B	-	-	Ml	B	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	BS/X1/Q & JS/X1/Q	Reyrolle-England	1982	0	Acc	-	-	Not AV
79. Coxa	-	-	-	-	-	Not Acc	B	-	-	Not Acc	B	Not Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	Safepus V	ABB	2008	SF6	Not Acc	-	-	AV
80. Trumali	-	-	-	-	-	Not Acc	B	-	-	Not Acc	B	Not Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	Safepus V	Reyrolle-England	1995	0	OD	-	-	AV
81. JC Smuts	-	-	-	-	-	Acc	B	-	-	Acc	B	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	T1 & T1/OF	Reyrolle-England	1980	0	Acc	-	-	Not AV
82. University Engineering Workshop	-	-	-	-	-	Ml	B	-	-	Ml	B	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	LMT2/X2/Q	GEC Power Distribution	-	0	Not Acc	-	-	Not AV
83. Krommer	-	-	-	-	-	Ml	B	-	-	Ml	B	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	Safepus V	ABB	2009	SF6	Acc	-	-	Not AV
84. Bergaicht Plaza	-	-	-	-	-	Ml	B	-	-	Ml	B	Acc	Av, B	Av, B	Not Available, Condition (Good or Bad)	-	-	Safepus V	Hawker Siderly	-	0	Acc	-	-	Not AV
85. Dros	-	-	-	-	-	Acc	B	-	-	Acc	B	Not Acc	Av, B	Av, B	Not Available, Condition (Good or Bad)	-	-	-	ABB	2011	SF6	Acc	-	-	Not AV
86. Bison Beard	-	-	-	-	-	Acc	B	-	-	Acc	B	Not Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	Safepus V	ABB	2009	SF6	Acc	-	-	Not AV
87. Glen Ely	-	-	-	-	-	-	G	-	-	-	G	Acc	Av, G & B	Av, G & B	Not Available, Condition (Good or Bad)	-	-	FRML MK1A	W. Luyt & Co Ltd, Oxford	2005	0	Acc	-	-	AV
88. Postkantoor	-	-	-	-	-	-	B	-	-	-	B	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	panel locked	-	-	-	-	-	-	Not AV
89. Waterwerke	-	-	-	-	-	-	B	-	-	-	B	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	-	-	-	-	-	-	-	Not AV
90. Oude Hoek	-	-	-	-	-	Ml	G	-	-	Ml	G	Acc	Not AV	Not AV	Not Available, Condition (Good or Bad)	-	-	T3/OF	GEC Power Distribution	1979	0	Not Acc	-	-	Not AV
91. Polisie	-	-	-	-	-	Ml	B	-	-	Ml	B	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	LMS/X2/QE	Reyrolle Parsons	Not AV	0	Acc	-	-	Not AV
92. Da Wals	-	-	-	-	-	Ml	B	-	-	Ml	B	Not Acc	Av, B	Av, B	Not Available, Condition (Good or Bad)	-	-	Safepus V	ABB	2011	SF6	Acc	-	-	Not AV
93. Hagenhof	-	-	-	-	-	Ml	B	-	-	Ml	B	Not Acc	Av, B	Av, B	Not Available, Condition (Good or Bad)	-	-	-	-	-	-	-	-	-	Not AV
94. De Heider	-	-	-	-	-	Ml	B	-	-	Ml	B	Not Acc	Not AV	Not AV	Not Available, Condition (Good or Bad)	-	-	T3/OF	GEC Power Distribution	1988	0	Not Acc	-	-	Not AV
95. Amantoni	-	-	-	-	-	Ml	B	-	-	Ml	B	Not Acc	Not AV	Not AV	Not Available, Condition (Good or Bad)	-	-	-	-	-	-	-	-	-	Not AV
96. East Lynne	-	-	-	-	-	Ml	G	-	-	Ml	G	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	JS/X1/Q	Reyrolle-England	-	0	Acc	-	-	Not AV
97. Rowan	-	-	-	-	-	Ml	G	-	-	Ml	G	Acc	Av, G	Av, G	Not Available, Condition (Good or Bad)	-	-	-	-	-	-	-	-	-	Not AV

Basis Notes

- The condition assessment was only a visual assessment from the ground (ie no tests were conducted nor samples taken) under energised conditions.
- Obsolete MV switchgear is due to the manufacturer no longer manufacturing the product range.

Abbreviations

- Acc - Acceptable
- Ad - Adequate
- Not Acc - Not Acceptable
- Not AV - Not Available
- AV - Available
- , -, Not Applicable

Substation Name	OUTDOOR HV YARD				INDOOR HV CONTROL ROOM				INDOOR MV SWITCHROOM													
	Trench cover - Acceptable or Not Acceptable, Missing	Yard - Erosion, Vegetation, Good	Transformer - Discouraging, Rust, Bird Nest, Oil leakage, Good	Transformer - Year of Manufacture	Corrosion: outdoor steelwork - Not Visible, Minor surface, Severe	Trench cover - Acceptable or Not Acceptable, Missing	House keeping - Good or Bad	House keeping - Good or Bad	Relays	Type	Manufacturer	Battery Tripping Unit - Condition (Good or Bad), Electrolyte levels (Below Minimum)	Type	Manufacturer	Year	Interrupting Medium - Oil, SF6, Vacuum	Switchgear - Acceptable or Not Acceptable, Obsolete	Type	Manufacturer	Relays	Arc Protection - Available or Not Available	

B - Bad  
 Be - Below Minimum  
 Bl - Bird Nest  
 Dis - Discolouring  
 Er - Erosion  
 G - Good  
 Inad - Inadequate  
 Ml - Missing  
 Ob - Obsolete  
 Oil - Oil leakage  
 Ru - Rust  
 Veg - Vegetation  
 Va - Vacuum  
 No - Not Visible  
 \* - Not commissioned  
 \*\* - Remote switching facility available



STELLENBOSCH MINIATURE SUBSTATION CONDITION ASSESSMENT - SUMMARY TABLE

Asset ID	Asset Name	Manufacturer	Serial Number	Rating	Overall Signage and Warning Notices (Y/N)	Phase Colour Coding Tags	Condition of all Doors	Condition and Availability of Locks	Grass and Vermin Proofing in Good Condition (Y/N)	Roof Bolts in Good Condition and No Open Gaps	Operating Handle on Site (Y/N)	576 Gas Pressure (Where Applicable) (Y/N)	Overall Earthing in Contact (Y/N)	TV Breakers Mounted Properly	Safety Barriers in Place and No Live Connections Exposed	Close Connections on TV Breakers	5MV Safety Barrier Fitted (Y/N)	Phase Barrier Boards are Fitted	Repaint Inside (Y/N)	Repaint Outside (Y/N)	Grass to be Removed from Inside/Outside Minibus (Y/N)	2k Rectifying Neutral Attention (Y/N)
146	LITTLE MS	GEC POWER DIST	16382	T3-0F	MISSING BACK		RUSTY, PAINT PEELING	DIRTY	GRASS INSIDE		Y	Y	Y	Y	Y	Y	Y	RUSTED	Repaint	Y	Y	
147	BIRZEGH MS	NOT LEGIBLE	NOT LEGIBLE	NOT LEGIBLE	Y			DIRTY	Y		Y	Y	Y	Y	Y	Y	Y	RUSTED	Repaint	Y	Y	
148	CULVER MS	NO LABEL	NO LABEL	NO LABEL	N		RUSTY, PAINT PEELING	PAINT CHIPPED	COCKROACHES/POISONOUS SPIDERS		Y	Y	Y	Y	Y	Y	Y	RUSTED	Repaint	Y	Y	
149	ENDER MS	HAWKER SIDLEY	FG 1672/3	NX3F	MISSING ON DOOR	LV	RUSTY	PAINT CHIPPED	SPIDERS		Y	Y	Y	Y	Y	Y	Y	RUSTED	Repaint	Y	Y	
150	UNDEANAN MS	REPCOLLE	37/025/742/589	OXSS/GEAR	ALL MISSING		RUSTY	PAINT CHIPPED	Y		Y	Y	Y	Y	Y	Y	Y	Y	Repaint	Y	Y	
151	PROTON MS	GEC POWER DIST	NOT LEGIBLE	NOT LEGIBLE	DANGER SIGNS		WEEDS AROUND	RUSTED	SPIDERS		Y	Y	Y	Y	Y	Y	Y	RUSTED	SAND	GRASS	Y	
152	TERMO MS	HAWKER SIDLEY	FG 332/1	NX3F	DANGER SIGNS			RUSTED	Y		Y	Y	Y	Y	Y	Y	Y	RUSTED	PAINT	Y	Y	
153	QUANTUM 3 MS	HAWKER SIDLEY	FG 332/1	NX3F	PAID DANGER SIGNS		RUBBER COMING OFF	RUSTY	GRASS INSIDE		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
154	QUANTUM 4 MS	W LUCY	JC 183/1	FRMA MK 1	PAID DANGER SIGNS			REPAINT	GRASS INSIDE		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
155	QUANTUM 2 MS (LABEL MISSING)	HAWKER SIDLEY	FG 872/1	NX3F	ALL MISSING			PAINT CHIPPED	SAND INSIDE		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
156	TIME SQUARE MS	HAWKER SIDLEY	NOT LEGIBLE	NOT LEGIBLE	PAID DANGER SIGNS			PAINT CHIPPED	SPIDERS		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
157	TECHOPARK 2 MS	GEC POWER DIST	22220	T3-0F	DANGER SIGNS		RUBBER COMING OFF	PAINT CHIPPED	SPIDERS AND RUSTY		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
158	POINTWINE MS (LABEL MISSING)	NO LABEL	NO LABEL	NO LABEL	PAID DANGER SIGNS				SPIDERS		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
159	ELECTRO HOUSE (RM)	ABB	2007231750008 B1 BOCV	CCV SAFE KING	PAID DANGER SIGNS				SPIDERS		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
160	ELECTION 2 MS (LABEL MISSING)	HAWKER SIDLEY	FG 328/13	NX3F	PAID DANGER SIGNS		RUSTY	RUSTED	SPIDERS AND GRASS		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
161	ELECTION 3 MS (LABEL MISSING)	NO LABEL	NO LABEL	NO LABEL	LV		ONE - OS		SPIDERS		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
162	ELECTION 4 MS	NOT LEGIBLE	NOT LEGIBLE	NOT LEGIBLE	PAID DANGER SIGNS		RUBBER COMING OFF	PAINT	SPIDERS AND SAND		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
163	ELECTION HOUSE MS	NOT LEGIBLE	NOT LEGIBLE	NOT LEGIBLE	PAID DANGER SIGNS		RUSTY	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
164	PROVISE MS (LABEL MISSING)	REPCOLLE	36/025/42/17	OXSS/GEAR	PAID DANGER SIGNS			OLD	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
165	APVENTUR MS	REPCOLLE	37/025/74/39	OXSS/GEAR	DANGER SIGNS		RUSTY, PAINT PEELING	PAINT CHIPPED	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
166	PROXIA MS	GEC POWER DIST	777774208	T3-0F	ALL MISSING		RUBBER COMING OFF	OLD	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
167	BLOKORAINDOORF MS	HAWKER SIDLEY	FG 222/1	NX3F	DANGER SIGNS		REPAINT	OLD	GRASS INSIDE		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
168	STONE MS	GEC POWER DIST	25382	T3-0F	WEARING OFF	MV	RUBBER COMING OFF	Y	GAP		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
169	WOODMAN MS (NOT LEGIBLE)	GEC POWER DIST	38787/13259	T3-0F	ALL MISSING		RUSTY	OLD	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
170	UNDIRMS	NO SWITCHGEAR	NO SWITCHGEAR	NO SWITCHGEAR	ALL MISSING	LV		OLD	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
171	UNDIRMS	REPCOLLE	37/025/74/259	OXSS/GEAR	ALL MISSING	LV		OLD	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
172	ASSEGAL MS	GEC POWER DIST	25240	T3-0F	DANGER SIGNS		REPAINT	OLD	GRASS INSIDE		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
173	PROXIA 2 MS	GEC POWER DIST	827/19/10318	T3-0F	ALL MISSING	LV	RUBBER COMING OFF	OLD	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
174	PROXIA MS	GEC POWER DIST	8177886/4	T3-0F	ALL MISSING	LV	RUBBER COMING OFF	OLD	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
175	PLESH MS	REPCOLLE	36/025/42/17	OXSS/GEAR	ONE MISSING	LV	PAINT PEELING, RUBBER COMING OFF	OLD	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
176	MORREL MS	NO LABEL	07381615F	NEFI	ONE MISSING	LV	RUBBER COMING OFF	OLD	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
177	JANNAF 2 MS	NO LABEL	37/025/74/242	OXSS/GEAR	MISSING	LV	PAINT PEELING, RUBBER COMING OFF	OLD	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
178	WATERMANS MS (NO LABEL)	ENGINE ELECTRIC	7777020	T3-0F	ALL MISSING	LV	RUSTED	OLD	BATS		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
179	UTSING MS (NO LABEL)	ENGINE ELECTRIC	7777020	T3-0F	ALL MISSING	LV	RUSTED	OLD	GAV ACCESS		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
180	VEREINDELT MS (NO LABEL)	LONG AND CRAWFORD	NOT LEGIBLE	NOT LEGIBLE	DANGER SIGNS			Y	SPIDERS		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
181	VEREINDELT MS (NO LABEL)	SCHEIDER ELECTRIC	58/2011/059/2/038	RM6 NE 01	Y	LV	Y	Y	GAV ACCESS		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
182	VEREINDELT MS (NO LABEL)	LUCY SWITCHGEAR	FG 1795/13	SUPERFLUE C COV	PAID DANGER SIGNS	LV	Y	Y	ROOTS		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
183	FLORIDA MS	ABB	2011115772001	FRMA MK 1A	PAID DANGER SIGNS	LV	Y	Y	ROOTS		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
184	FLORIDA MS	ABB	17558	T3-0F	Y	LV	RUSTY, RUBBER COMING OFF	OLD	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
185	FLORIDA MS	GEC POWER DIST	22287	T3-0F	ALL MISSING	LV	RUBBER COMING OFF	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
186	SCOUT PRAYS MS	HAWKER SIDLEY	FG 348/7/3	T3-0F	PAID DANGER SIGNS	LV	RUBBER COMING OFF	OLD	SMALLS		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
187	PARADYSLOOP FAS	GEC POWER DIST	25384	T3-0F	PAID DANGER SIGNS	LV	RUBBER COMING OFF	OLD	GRASS		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
188	PARADYSLOOP FAS (NO LABEL)	HAWKER SIDLEY	21857	T3-0F	PAID DANGER SIGNS	LV	RUBBER COMING OFF	OLD	DIRTY		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
189	LE MONTHER MS	GEC POWER DIST	FG 192/7/3	NX3F	Y	LV	DIRTY	OLD	GRASS		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
190	CRISTINA BROUERS MS	ABB	200622556001 B1 BOCV	SAFERING COV	Y	LV	RUBBER COMING OFF	OLD	DIRTY		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
191	CRISTINA BROUERS MS	NOT LEGIBLE	NOT LEGIBLE	NOT LEGIBLE	PAID DANGER SIGNS	LV	RUBBER COMING OFF	OLD	GAV ACCESS		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
192	PARADYSLOOP FAS	ME TRANSGEAR 77	FG 27515/15	16E3	DANGER SIGNS	LV	RUBBER COMING OFF	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
193	PARADYSLOOP FAS	HAWKER SIDLEY	FG 2832/16	NX3F	PAID DANGER SIGNS	LV	RUBBER COMING OFF	OLD	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
194	HERMITAGE	HAWKER SIDLEY	FG 3185/26	NX3F	PAID DANGER SIGNS	LV	RUBBER COMING OFF	OLD	LIZARDS AND SPIDERS		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
195	AMSTAMA MS	W LUCY	FG 1000/1	FRMA MK 1	DANGER SIGNS	LV	RUBBER COMING OFF	OLD	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
196	AMSTAMA MS	REPCOLLE	36/025/42/40	OXSS/GEAR	ALL MISSING	LV	RUBBER COMING OFF	OLD	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
197	AMSTAMA MS	LUCY SWITCHGEAR	FG 1795/13	FRMA MK 1A	PAID DANGER SIGNS	LV	RUBBER COMING OFF	OLD	GRASS		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
198	AMSTAMA MS	REPCOLLE	20/025/74/217	OXSS/GEAR	Y	LV	RUBBER COMING OFF	OLD	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
199	AMSTAMA MS	REPCOLLE	20/025/74/217	OXSS/GEAR	Y	LV	RUBBER COMING OFF	OLD	LIZARDS AND SPIDERS		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
200	BRANDWACHT 2 MS	REPCOLLE	20/025/74/217	OXSS/GEAR	Y	LV	RUBBER COMING OFF	OLD	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
201	BRANDWACHT 1 MS	REPCOLLE	20/025/74/217	OXSS/GEAR	Y	LV	RUBBER COMING OFF	OLD	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
202	BRANDWACHT 2 MS	GEC POWER DIST	18785	T3-0F	Y	LV	RUSTED, RUBBER COMING OFF	OLD	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
203	BRANDWACHT 1 MS	REPCOLLE	36/025/42/216	OXSS/GEAR	Y	LV	RUSTY	Y	GRASS		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
204	BRANDWACHT 2 MS	GEC POWER DIST	827/19/10257	T3-0F	ALL MISSING	LV	RUSTY, REPAINT	OLD	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
205	BRANDWACHT 1 MS	REPCOLLE	37/025/74/216	OXSS/GEAR	ALL MISSING	LV	REPAINT	OLD	GRASS		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
206	BRANDWACHT 2 MS	GEC POWER DIST	15383	T3-0F	PAID DANGER SIGNS	LV	RUBBER COMING OFF	OLD	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
207	BRANDWACHT 1 MS	REPCOLLE	36/025/42/40	OXSS/GEAR	PAID DANGER SIGNS	LV	RUBBER COMING OFF	OLD	GRASS		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
208	BRANDWACHT 2 MS	GEC POWER DIST	23682	T3-0F	PAID DANGER SIGNS	LV	RUSTED	OLD	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
209	BRANDWACHT 1 MS	REPCOLLE	36/025/42/217	OXSS/GEAR	PAID DANGER SIGNS	LV	RUBBER COMING OFF	OLD	SPIDERS		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
210	BRANDWACHT 2 MS	REPCOLLE	36/025/42/217	OXSS/GEAR	ALL MISSING	LV	REPAINT, RUBBER TEARING	OLD	Y		Y											



3.	MOBLE MS	W LUCY	84/2874/9	FRAU MK1	Y	Phase Colour Coding Tags	Condition of all Doors	Condition and Availability of Locks	Condition of Cooling Fans	Crack and Vermin Proofing in Good	Condition (Y/N)	Operating Handle on Site (Y/N)	Sf6 Gas Pressure (Where Applicable)	Overall Earthing in Contact (Y/N)	LV Breakers Mounted Properly	Safety Barriers in Place and No Live Connections Exposed	Loose Connections on LV Breakers	AV Safety Barrier fitted (Y/N)	Phase Barrier Boards are Fitted	Between Phases	Repaint Inside (Y/N)	Repaint Outside (Y/N)	Grass to be Removed from Inside/Outside Minibus (Y/N)	Backfilling need Attention (Y/N)
276							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4.	LAPANA 1 MS	W LUCY	84/294/14	FRAU MK1	N (SOME MISSING)	LV	REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
5.	LAPANA 2 MS	GFC POWER DIST.	21691	TEJOF	350 WVA	LV	DIRTY	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
6.	ALL MS	W LUCY	84/2874/7	FRAU MK1	FABED/DAMAGED	LV	REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
7.	TENNANT MS	W LUCY	84/2874/4	FRAU MK1	FABED/DAMAGED	LV	REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
8.	HOSPITAL MS	W LUCY	NOT LEGIBLE	FRAU MK1	FABED	LV	DIRTY	OLD	DIRTY	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
282							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
283							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
284							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
285							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
286							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
287							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
288							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
289							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
290							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
291							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
292							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
293							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
294							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
295							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
296							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
297							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
298							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
299							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
300							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
301							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
302							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
303							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
304							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
305							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
306							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
307							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
308							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
309							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
310							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
311							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
312							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
313							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
314							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
315							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
316							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
317							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
318							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
319							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
320							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
321							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
322							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
323							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
324							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
325							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
326							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
327							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
328							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
329							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
330							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
331							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
332							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
333							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
334							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
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338							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
339							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
340							REPAIR	OLD	REPAIR	Y	Crack and Vermin Proofing in Good	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
341																								



Address/Location	Mini Ring Network	Make	Serial Number	Type	Rating	Overall Signage and Warning Notices (Y/N)	Phase Colour Coding Tags	Condition of all Doors	Condition and Availability of Locks	Condition of Cooling Fans	Grass and Vermin Proofing in Good Condition (Y/N)	Roof Bolts in Good Condition and No Open Gaps	Operating Handle on Site (Y/N)	SF6 Gas Pressure (Where Applicable) (Y/N)	Overall Earthing in Contact (Y/N)	LV Breakers Mounted Properly	Safety Barriers in Place and No Live Connections Exposed	Loose Connections on LV Breakers (Y/N)	MV Safety Barrier fitted (Y/N)	Phase Barrier Boards are Fitted between Phases	Repaint Inside (Y/N)	Repaint Outside (Y/N)	Grass to be Removed from Inside/Outside Minisub (Y/N)	Backfilling need Attention (Y/N)
LAYSLEY MS	-	DELTA POWER MARTHA	20082.285.320.008	ABB	21kVA	Y	-	Y	Y	PAINT CHIPPED	SPIDERS	-	Y	-	Y	Y	N	-	-	Y	Y	Y	N	
TEHUUS MS	-	-	-	5L76LC 010	-	Y	-	REPAINT	Y	PAINT CHIPPED	SPIDERS	-	-	-	-	Y	N	-	-	-	Y	Y	N	
BECARVA MS	-	POWER ENGINEER	2.22597	315kVA	315kVA	N	LV	RUSTED	Y	N	SPIDERS	-	Y	-	Y	N	N	-	-	Y	Y	Y	N	
BUJESIA TRAF (CANT ROAD WRITING)	-	POWER TRANSFORMER	1PT1322	SAFEPLUS/SCC	500 kVA	N	-	-	-	Y	N	-	Y	-	Y	N	N	-	-	Y	Y	Y	N	
ECCLESIA RAM	-	LUCY	185.1500	FRVAU MKXIA	31.1 kVA	-	-	-	-	Y	N	-	-	-	Y	N	N	-	-	-	Y	Y	N	
<b>HAD TO CHANGE ADDRESS/LOCATION</b>																								

**Basix Notes**

1. The condition assessment was only a visual assessment from the ground (ie no tests were conducted nor samples taken) under energised conditions.
2. Obsolete MV switchgear is due to the manufacturer no longer manufacturing the product range.

**Abbreviations**

- Acc - Accidents - Not Applicable
- Adf - Adf Not Av - Not Available
- Av - Awa - - - Not Applicable
- B - Bad Ob - Obsolete
- Bc - Bc Oil Le Oil Leakage
- Br - Br - - -
- Dh - Dh Veg - Vegetation
- Ef - Eros Vc - Vacuum
- G - Gook No - Not Visible
- Inad - In - Not commissioned
- Mi - Mi - - Remote switching facility available



LANGRUG 2 MS DENNEGURRAU		567	568	Address/Location	Mini Ring Network	Make	DESTIA POWER LUCY	Serial Number	3062041702	Type		Rating	500 kVA	Y	Overall Signage and Warning Notices (Y/N)		Phase Colour Coding Tags	REPAINT	Condition of all Doors	OLD	Condition and Availability of Locks	PAINT CHIPPED	Condition of Cooling Fins	SPIDERS	Grass and Vermin Proofing in Good Condition (Y/N)		Root Bolts in Good Condition and No Open Gaps	Y	Operating Handle on Site (Y/N)		SF6 Gas Pressure (Where Applicable) (Y/N)		Overall Earthing in Contact (Y/N)		LV Breakers Mounted Properly		Safety Barriers in Place and No Live Connections Exposed	N	Loose Connections on LV Breakers (Y/N)		MV Safety Barrier Fitted (Y/N)	Y	Phase Barrier Boards are Fitted Between Phases		Repaint Inside (Y/N)	N	Repaint Outside (Y/N)	Y	Grass to be Removed from Inside/Outside Minisub (Y/N)	N	Backfilling need Attention (Y/N)	N
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Basic Notes

1. The condition assessment was only a visual assessment from the ground (ie no tests were conducted nor samples taken) under energised conditions.
2. Obsolete MV switchgear is due to the manufacturer no longer manufacturing the product range.

- Abbreviations - Not Accrable  
 Ad - Admittance - Not Available  
 Av - Av - Not Available  
 Av - Av - Not Available  
 B - Bad Ob - Obsolete  
 Be - Be Oil - Oil Leakage  
 Bk - Breaker  
 DS - DS - Not Available  
 Er - Er - Not Available  
 G - Ground - Not Visible  
 Inad - In - Not Commissioned  
 M - M - Not Commissioned  
 M - M - Not Commissioned Facility available

FRANSHOEK CONDITION ASSESSMENT - SUBSTATIONS SUMMARY TABLE

Substation Name	OUTDOOR HV YARD			INDOOR HV CONTROL ROOM			INDOOR MV SWITCHROOM												
	Trench cover - Acceptable or Not	Yard - Erosion, Vegetation, Good	Transformer - Discolouring, Rust, Bird Nest, Oil leakage, Good	Transformer - Year of Manufacture	Corrosion: outdoor steelwork - Not Visible, Minor surface, Severe	Trench cover - Acceptable or Not	House keeping - Good or Bad	House keeping - Good or Bad	Verm and Water Protection - Acceptable or Not	Fire Extinguisher - Available or Not	Battery Tripping Unit - Condition (Good or Bad), Electrolyte levels (Below Minimum)	Type	Manufacturer	Year	Interrupting Medium - Oil, SF6, Vacuum	Switchgear - Acceptable or Not	Relays	Manufacturer	Arc Protection - Available or Not
Monument 11kV Sub	-	-	-	-	-	Acceptable, Missing	G	ACC	ACC	AV	G	SBVA	Alstom	2006	Va	ACC			Not AV
Huguenote 11kV SS	-	-	-	-	-	ACC	G	ACC	AV	G	SBVA	Alstom	2006	Va	ACC			Not AV	
Groendal 11kV SS	-	-	-	-	-	ACC	G	ACC	AV	G	SBVA	Alstom	2003	Va	ACC			Not AV	

Basis Notes

- The condition assessment was conducted from the 27/05/2015 by J Niemann
- The condition assessment was only a visual assessment from the ground (ie no tests were conducted nor samples taken) under energised conditions.
- Obsolete MV switchgear is due to the manufacturer no longer manufacturing the product range.

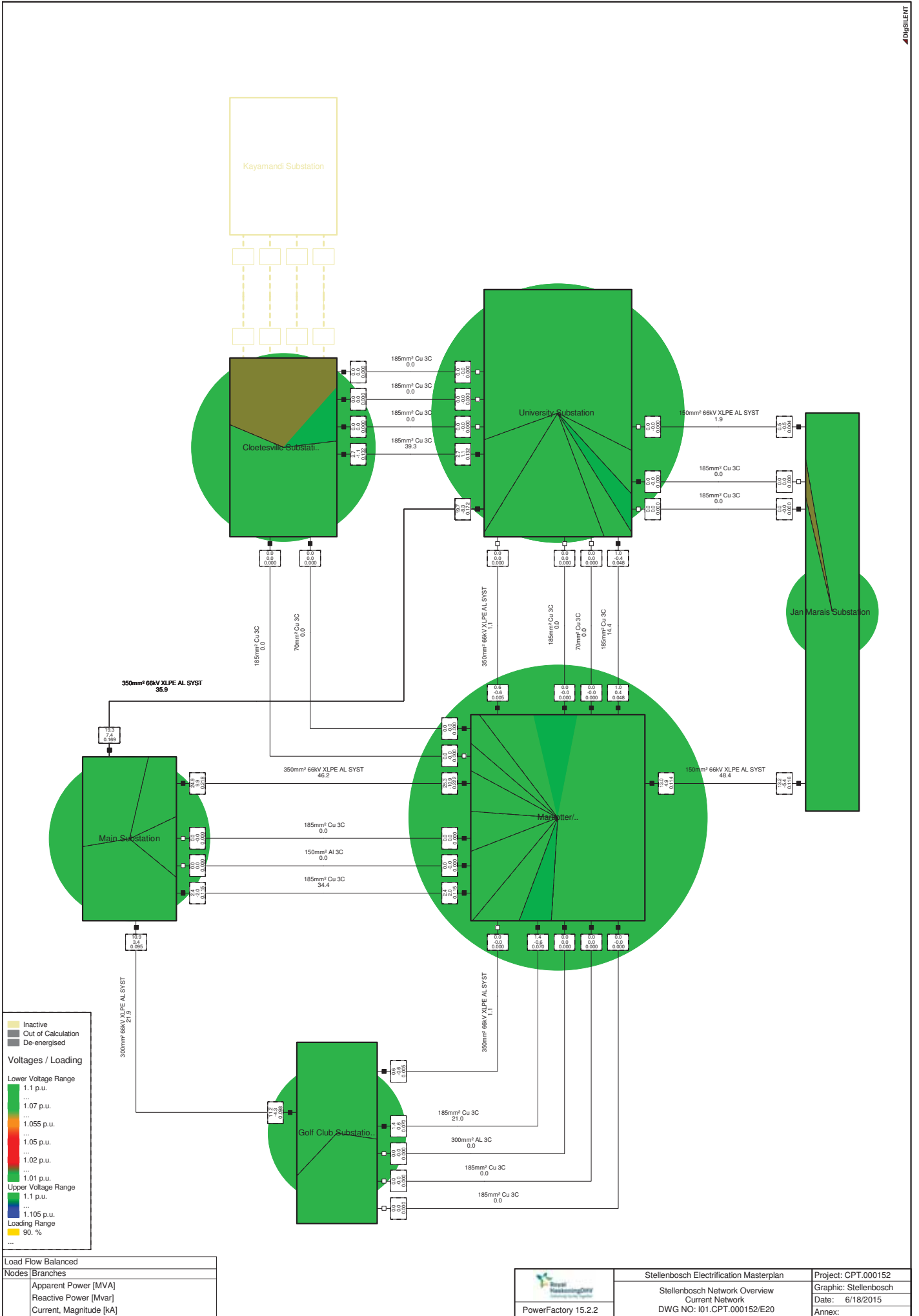
Abbreviations

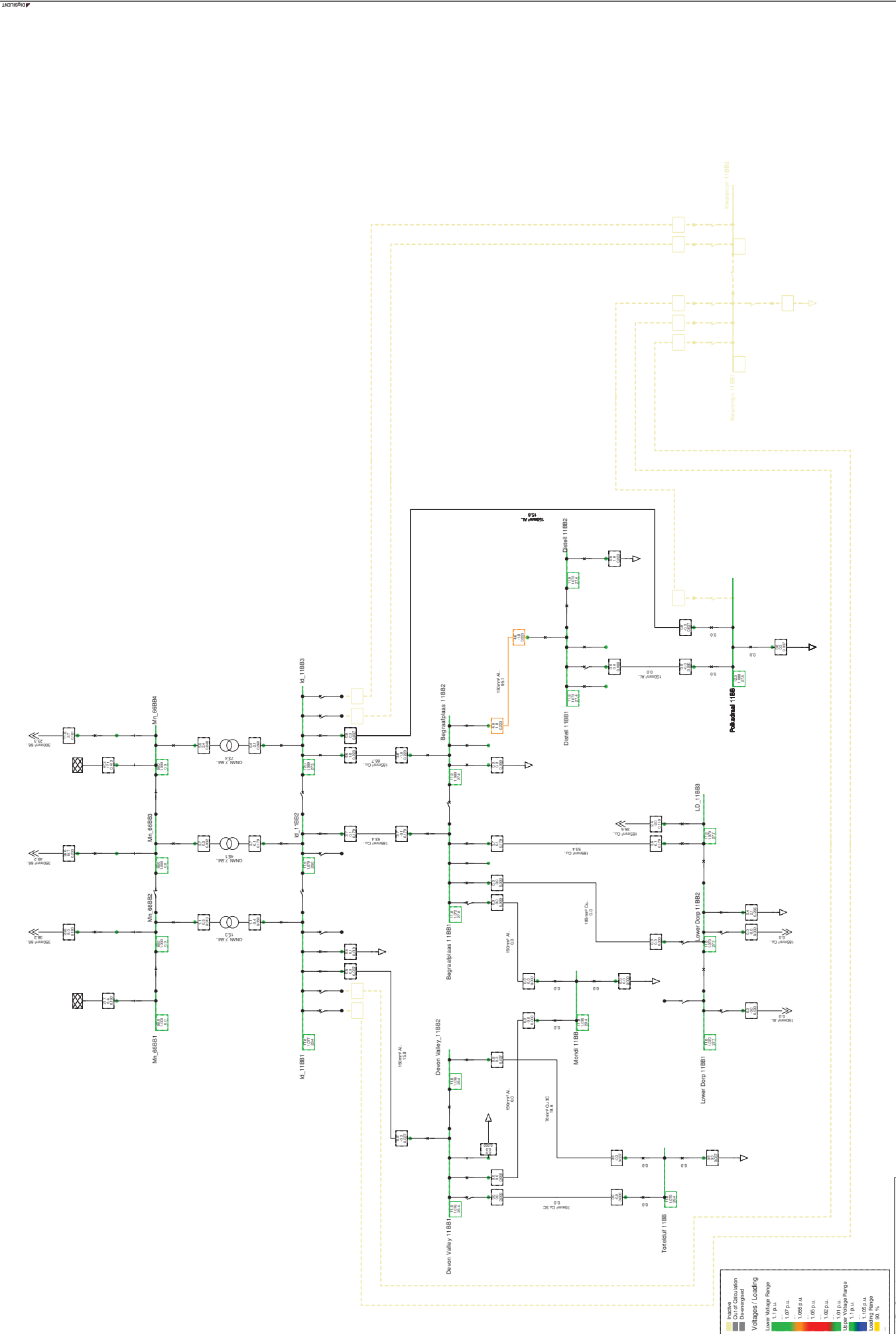
- Acc - Acceptable
- Not Acc - Not Acceptable
- Ad - Adequate
- Not AV - Not Available
- AV - Available
- "-", Not Applicable
- B - Bad
- Ob - Obsolete
- Be - Below Minimum
- Oil - Oil leakage
- Bl - Bird Nest
- Ru - Rust
- Dis - Discolouring
- Veg - Vegetation
- Er - Erosion
- Va - Vacuum
- G - Good
- No - Not Visible
- Inad - Inadequate
- \* - Not commissioned
- Ml - Missing
- \*\* - Remote switching facility available



## APPENDIX D : NETWORK SINGLE LINE DIAGRAMS

DRAWING NUMBER	TITLE
I01.CPT.000127/E20	Stellenbosch Network Overview, current network
I01.CPT.000127/E21	Main Substation SLD, Current network
I01.CPT.000127/E22	Markotter Substation SLD, Current network
I01.CPT.000127/E23	University Stellenbosch Substation SLD, Current network
I01.CPT.000127/E24	Jan Marais Substation SLD, current network
I01.CPT.000127/E25	Golf Club Substation SLD, Current network
I01.CPT.000127/E26	Cloetesville Substation SLD, Current network
I01.CPT.000127/E28	Franschhoek Substation SLD, Current network
I01.CPT.000127/E30	Stellenbosch Network Overview, High growth
I01.CPT.000127/E31-E38	Substation SLD's, High growth
I01.CPT.000127/E40	Stellenbosch Network Overview, Realistic growth
I01.CPT.000127/E41-48	Substation SLD's, Realistic Growth





**Legend**

- Inactive
- Out of Operation
- Line Under Repair

**Voltages / Loading**

Lower Voltage Range

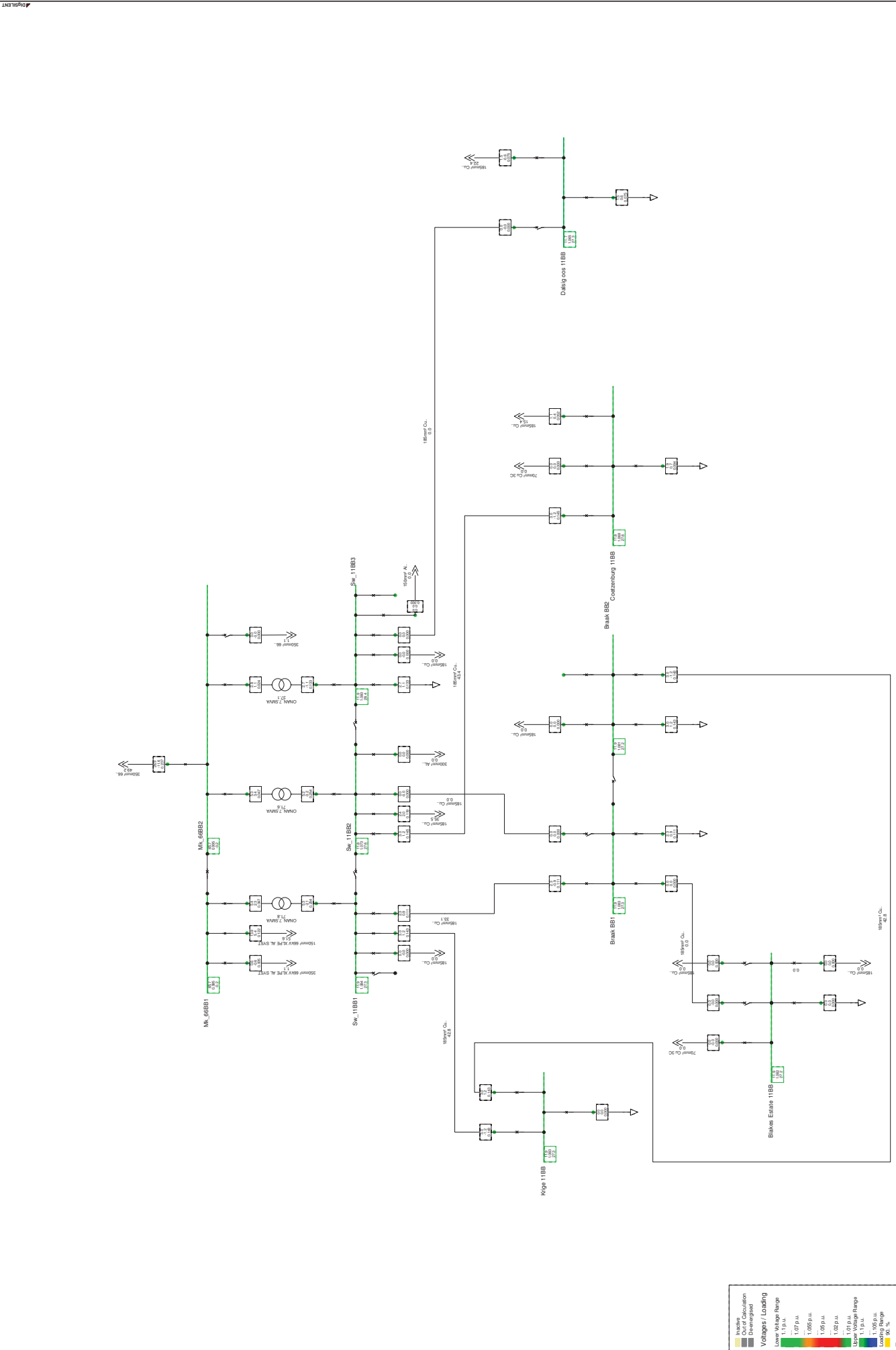
- 1.07 p.u.
- 1.065 p.u.
- 1.06 p.u.
- 1.05 p.u.
- 1.04 p.u.
- 1.03 p.u.
- 1.02 p.u.
- 1.01 p.u.

Upper Voltage Range

- 1.1 p.u.
- 1.105 p.u.
- 1.11 p.u.
- 1.115 p.u.
- 1.12 p.u.
- 1.125 p.u.
- 1.13 p.u.
- 1.135 p.u.
- 1.14 p.u.
- 1.145 p.u.
- 1.15 p.u.
- 1.155 p.u.
- 1.16 p.u.
- 1.165 p.u.
- 1.17 p.u.
- 1.175 p.u.
- 1.18 p.u.
- 1.185 p.u.
- 1.19 p.u.
- 1.195 p.u.
- 1.2 p.u.

**Load Flow Balancing**

Nodes	Branches
Line-Line Voltage, Magnitude (kV)	Apparent Power (MVA)
Voltage, Magnitude (p.u.)	Reactive Power (Mvar)
Voltage, Angle (deg)	Current, Magnitude (kA)



**Legend**

- Inactive
- Out of Calculation
- Not in Scope

**Busbars / Landing**

**Low Voltage Range**

- 1.07 p.u.
- 1.065 p.u.
- 1.06 p.u.
- 1.055 p.u.
- 1.05 p.u.
- 1.045 p.u.
- 1.04 p.u.
- 1.035 p.u.
- 1.03 p.u.
- 1.025 p.u.
- 1.02 p.u.
- 1.015 p.u.
- 1.01 p.u.
- 1.005 p.u.
- 1.00 p.u.

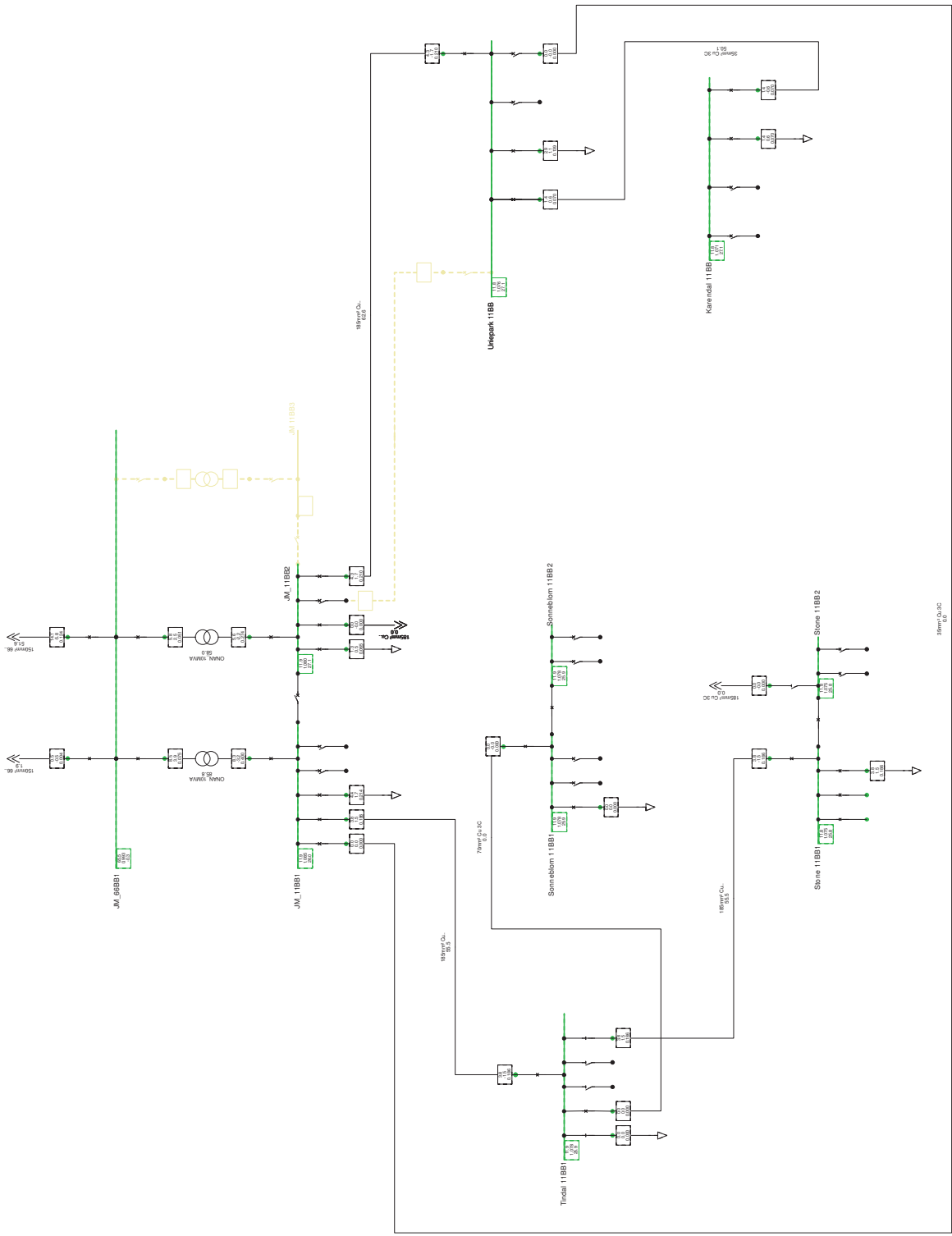
**Upper Voltage Range**

- 1.01 p.u.
- 1.005 p.u.
- 1.00 p.u.
- 0.995 p.u.
- 0.99 p.u.
- 0.985 p.u.
- 0.98 p.u.
- 0.975 p.u.
- 0.97 p.u.
- 0.965 p.u.
- 0.96 p.u.
- 0.955 p.u.
- 0.95 p.u.
- 0.945 p.u.
- 0.94 p.u.
- 0.935 p.u.
- 0.93 p.u.
- 0.925 p.u.
- 0.92 p.u.
- 0.915 p.u.
- 0.91 p.u.
- 0.905 p.u.
- 0.90 p.u.

**Load Flow Summary**

Busbar	Line-Line Voltage, Magnitude [kV]	Apparent Power [MVA]	Reactive Power [Mvar]	Voltage, Magnitude [p.u.]	Current, Magnitude [kA]





**Legend**

- Inactive
- Out of Calculation
- Not in the scope of the study
- Not in the scope of the study

**Voltages / Loading**

Low Voltage Range

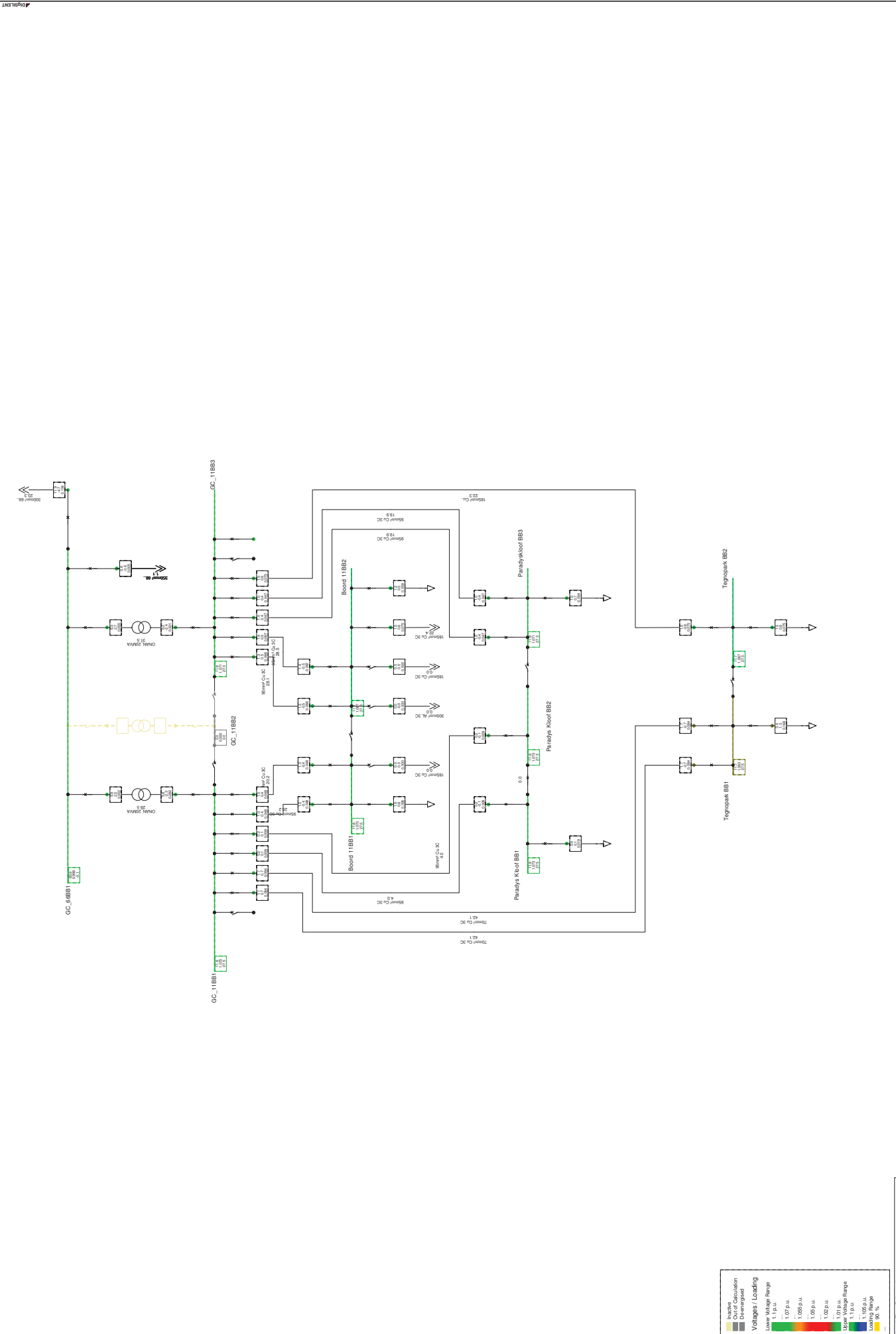
- 1.07 p.u.
- 1.065 p.u.
- 1.06 p.u.
- 1.05 p.u.
- 1.04 p.u.
- 1.03 p.u.

Upper Voltage Range

- 1.1 p.u.
- 1.105 p.u.
- 1.100 p.u.
- 1.095 p.u.
- 1.09 p.u.
- 1.08 p.u.
- 1.07 p.u.

**Load Flow Summary**

Nodes	Branches	Line-Line Voltage, Magnitude [kV]	Apparent Power [MVA]	Reactive Power [Mvar]	Voltage, Magnitude [p.u.]	Current, Magnitude [kA]



**Legend**

- Inactive
- Out of Calculation
- Not in Scope

**Voltages / Loading**

Lower Voltage Range

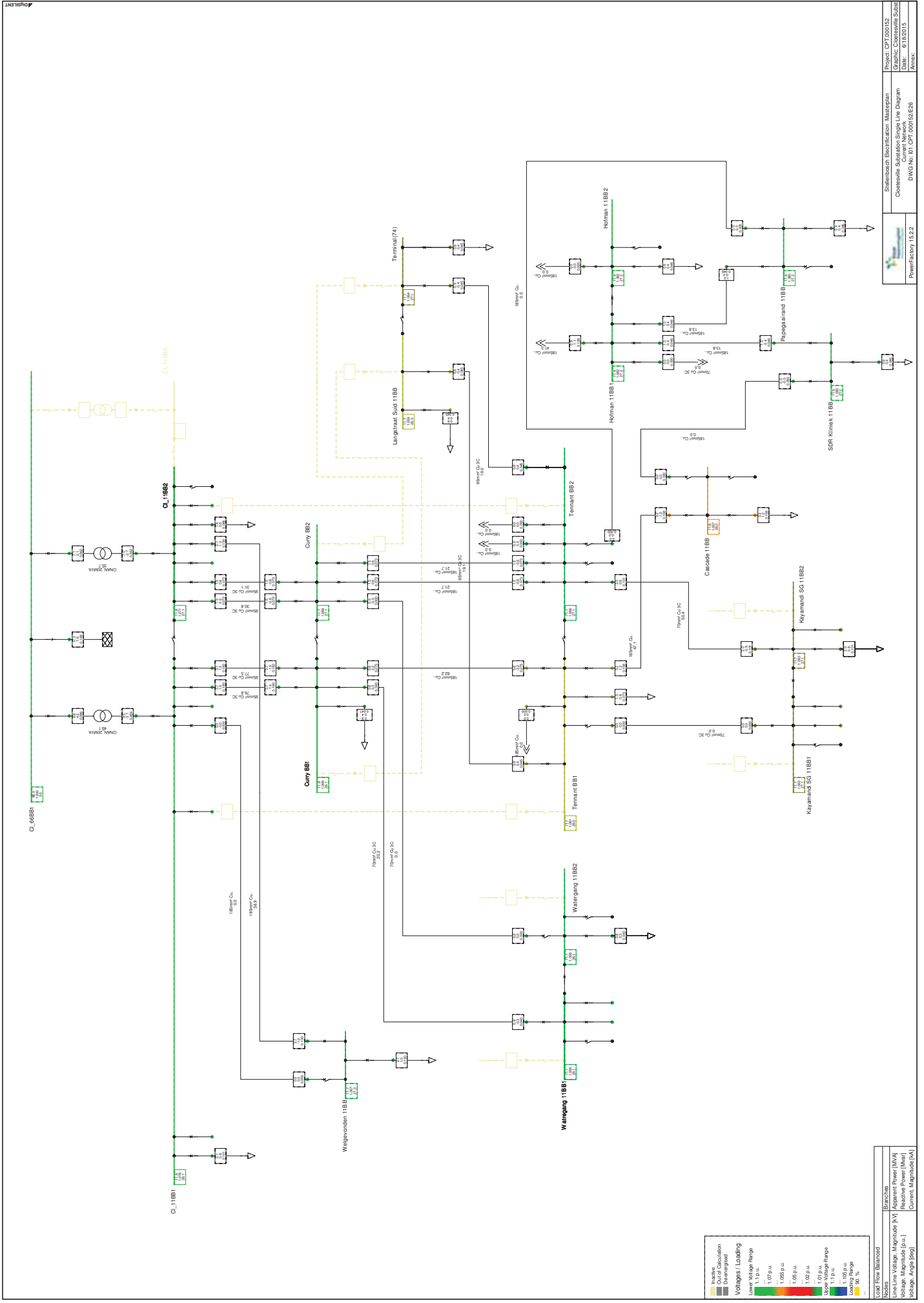
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- 1.065 p.u.
- 1.06 p.u.
- 1.055 p.u.
- 1.05 p.u.
- 1.045 p.u.
- 1.04 p.u.

Upper Voltage Range

- 1.1 p.u.
- 1.105 p.u.
- 1.11 p.u.
- 1.115 p.u.
- 1.12 p.u.
- 1.125 p.u.
- 1.13 p.u.
- 1.135 p.u.
- 1.14 p.u.
- 1.145 p.u.
- 1.15 p.u.
- 1.155 p.u.
- 1.16 p.u.
- 1.165 p.u.
- 1.17 p.u.
- 1.175 p.u.
- 1.18 p.u.
- 1.185 p.u.
- 1.19 p.u.
- 1.195 p.u.
- 1.2 p.u.

**Load Flow Balance**

Nodes	Branches
Line-Line Voltage, Magnitude [kV]	Apparent Power [MVA]
Voltage, Magnitude [p.u.]	Reactive Power [Mvar]
Voltage, Angle [deg]	Current, Magnitude [kA]



**Legend**

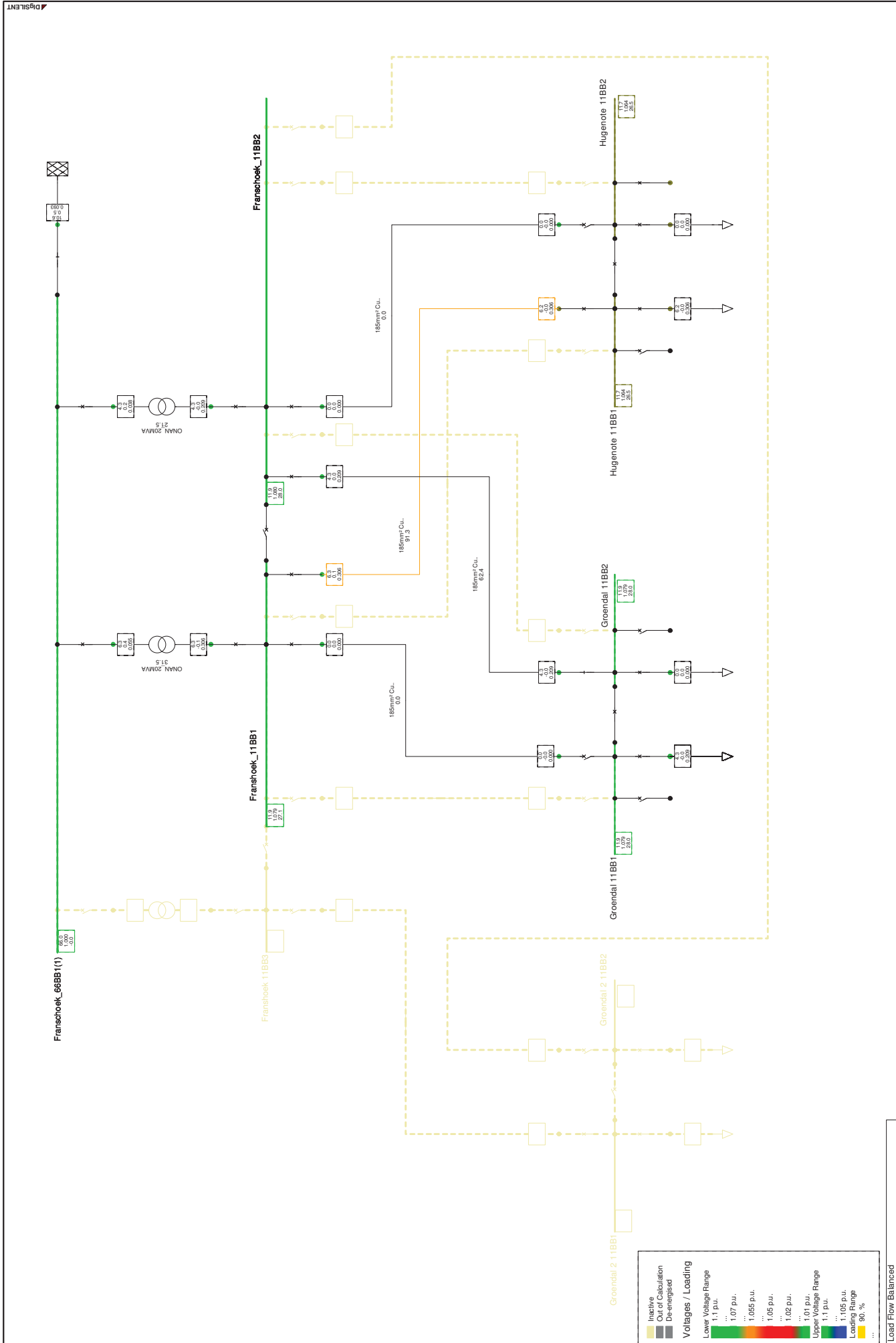
- Inactive
- Out of Operation
- Breaker Open
- Voltages / Loading
- Low Voltage Range
- Upper Voltage Range

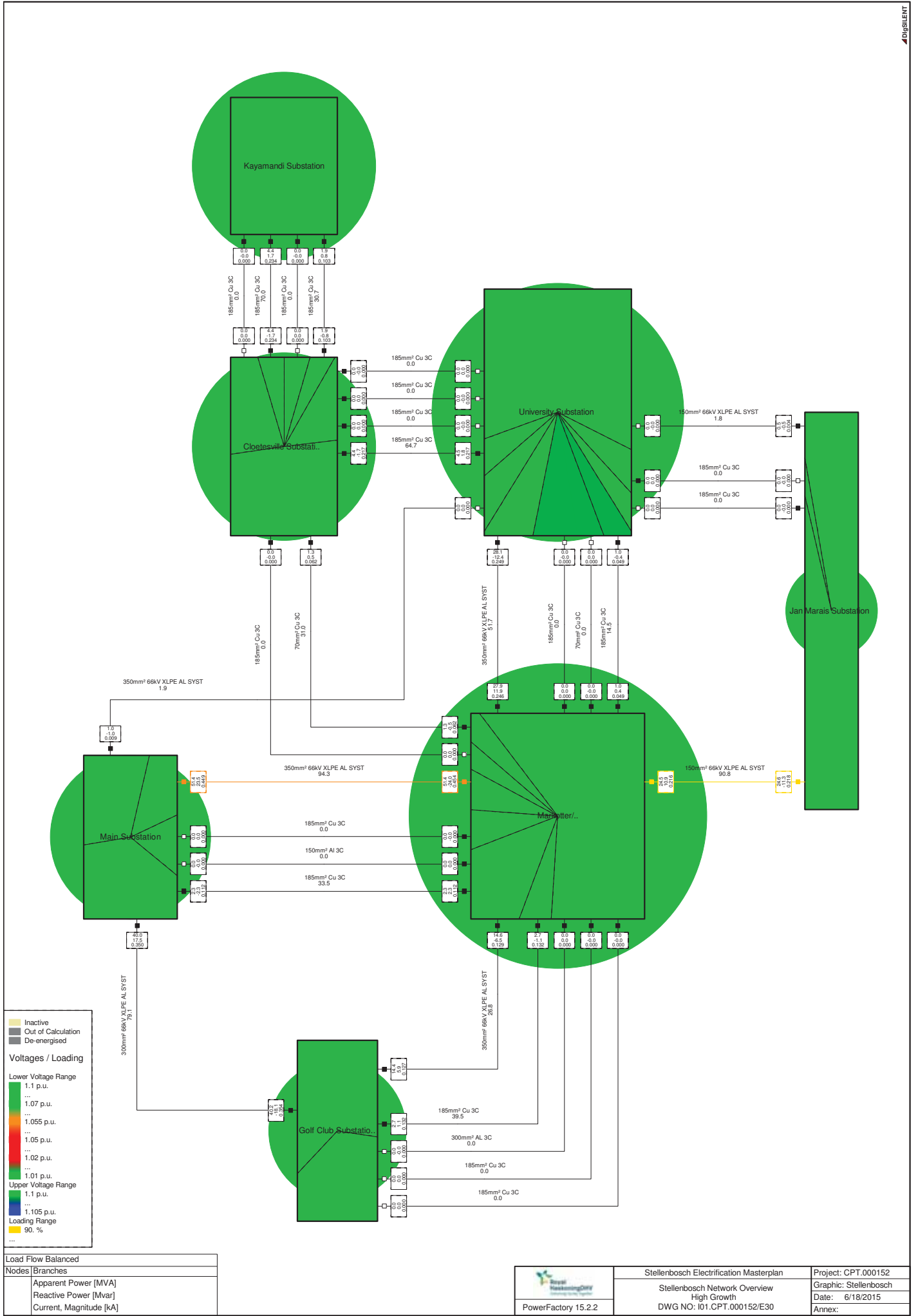
Color	Value
Green	1.07 p.u.
Yellow	1.065 p.u.
Orange	1.06 p.u.
Red	1.05 p.u.
Dark Red	1.04 p.u.
Dark Blue	1.1 p.u.
Light Blue	1.155 p.u.
White	1.2 p.u.
Black	1.25 p.u.
Grey	1.3 p.u.
Light Grey	1.35 p.u.
Dark Grey	1.4 p.u.
Black	1.45 p.u.
Dark Blue	1.5 p.u.
Light Blue	1.55 p.u.
White	1.6 p.u.
Light Grey	1.65 p.u.
Dark Grey	1.7 p.u.
Black	1.75 p.u.
Dark Blue	1.8 p.u.
Light Blue	1.85 p.u.
White	1.9 p.u.
Light Grey	1.95 p.u.
Dark Grey	2.0 p.u.

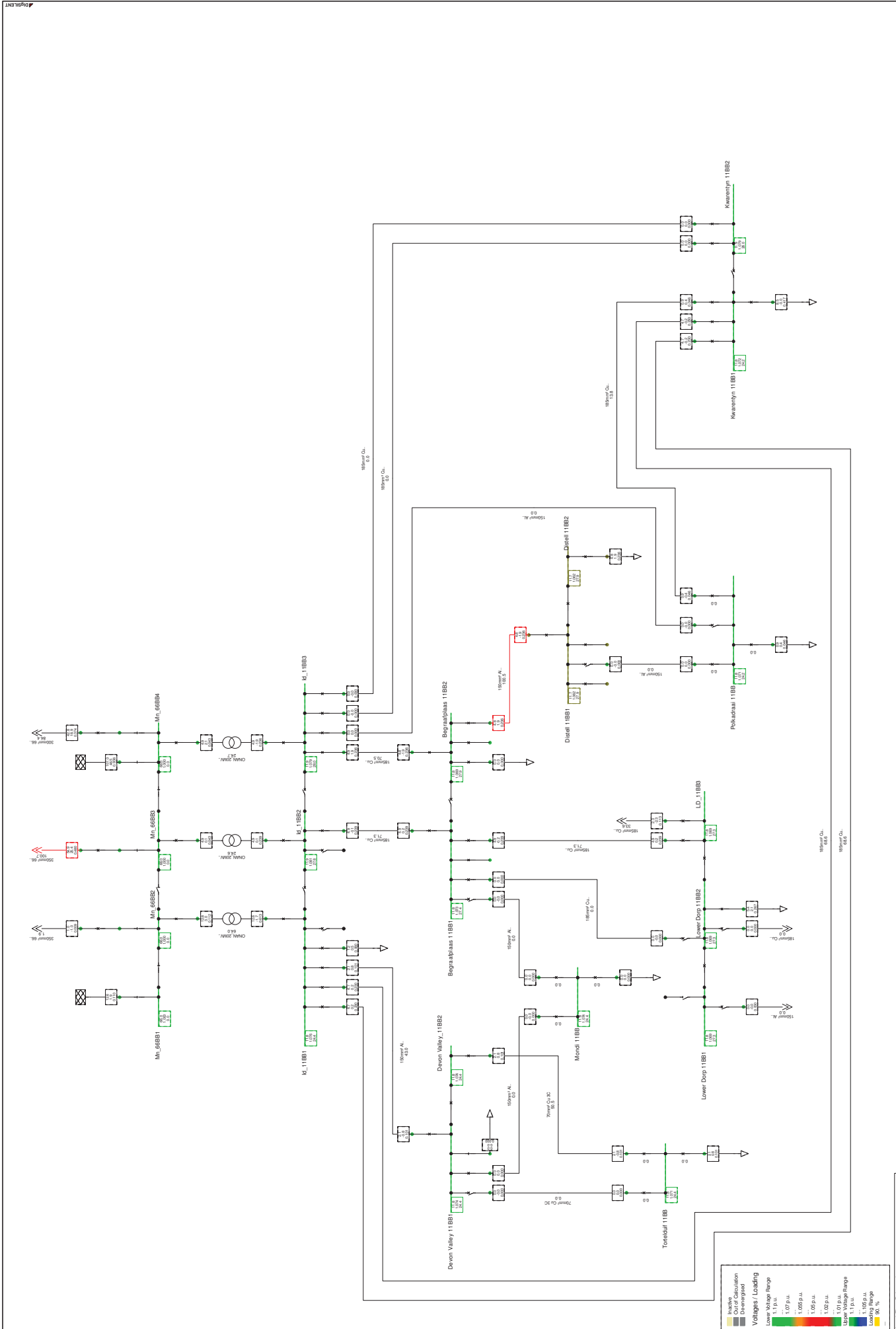
**Notes**

Symbol	Meaning
Branches	Branches
Line-Line Voltage, Magnitude [kV]	Line-Line Voltage, Magnitude [kV]
Apparent Power [MVA]	Apparent Power [MVA]
Reactive Power [Mvar]	Reactive Power [Mvar]
Voltage, Magnitude [p.u.]	Voltage, Magnitude [p.u.]
Current, Magnitude [kA]	Current, Magnitude [kA]









**Legend**

- Inactive
- Out of Calculation
- Line or Tap
- Busbar / Landing

**Voltage / Landing**

Lower Voltage Range

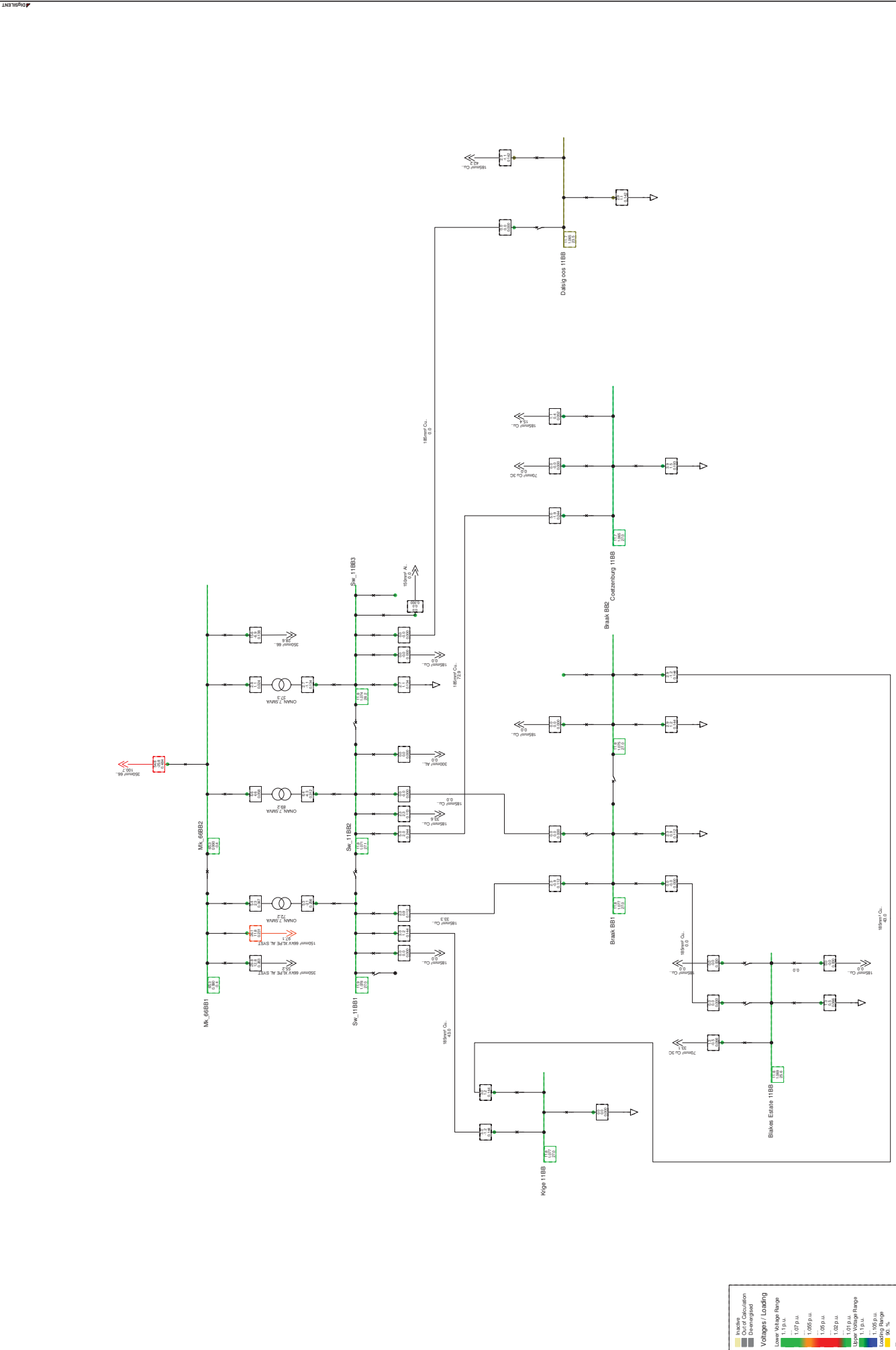
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- 1.065 p.u.
- 1.06 p.u.
- 1.055 p.u.
- 1.05 p.u.
- 1.045 p.u.
- 1.04 p.u.
- 1.035 p.u.
- 1.03 p.u.
- 1.025 p.u.
- 1.02 p.u.
- 1.015 p.u.
- 1.01 p.u.
- 1.005 p.u.
- 1.00 p.u.

Upper Voltage Range

- 1.005 p.u.
- 1.01 p.u.
- 1.015 p.u.
- 1.02 p.u.
- 1.025 p.u.
- 1.03 p.u.
- 1.035 p.u.
- 1.04 p.u.
- 1.045 p.u.
- 1.05 p.u.
- 1.055 p.u.
- 1.06 p.u.
- 1.065 p.u.
- 1.07 p.u.

**Load Flow Balance**

Nodes	Branches
Line-Line Voltage, Magnitude (kV)	Apparent Power (MVA)
Voltage, Magnitude (p.u.)	Reactive Power (Mvar)
Voltage, Angle (deg)	Current, Magnitude (kA)



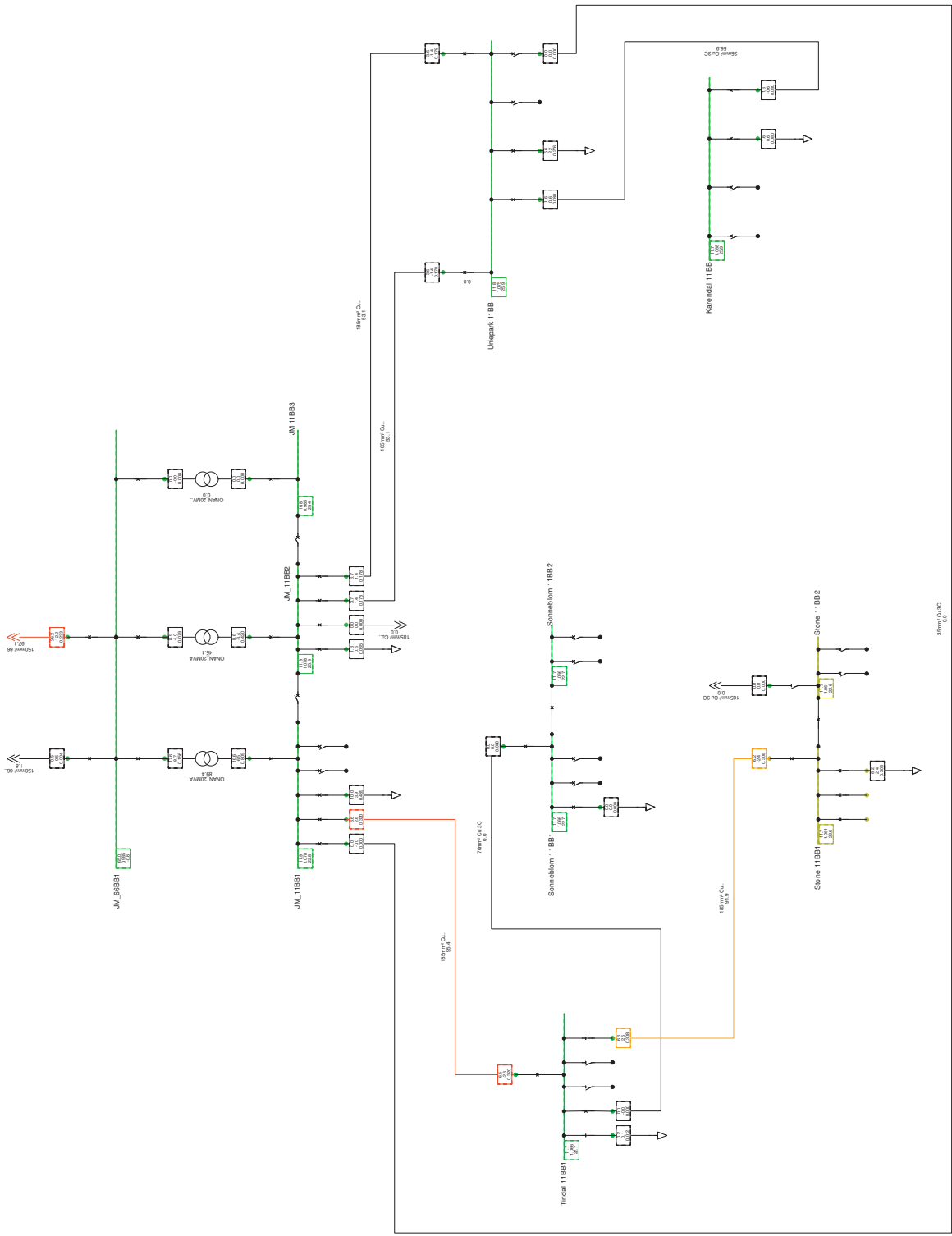
**Legend**

- Inactive
- Out of Operation
- Normal Operation

**Load Flow Balance**

Branches	Line-Line Voltage, Magnitude [kV]	Apparent Power [MVA]	Reactive Power [Mvar]	Voltage, Magnitude [p.u.]	Current, Magnitude [kA]
Line-Line Voltage, Magnitude [kV]					
Apparent Power [MVA]					
Reactive Power [Mvar]					
Voltage, Magnitude [p.u.]					
Current, Magnitude [kA]					





**Legend**

- Inactive
- Out of Calculation
- Not in the scope of the study
- Not in the scope of the study

**Voltages / Loading**

Low Voltage Range

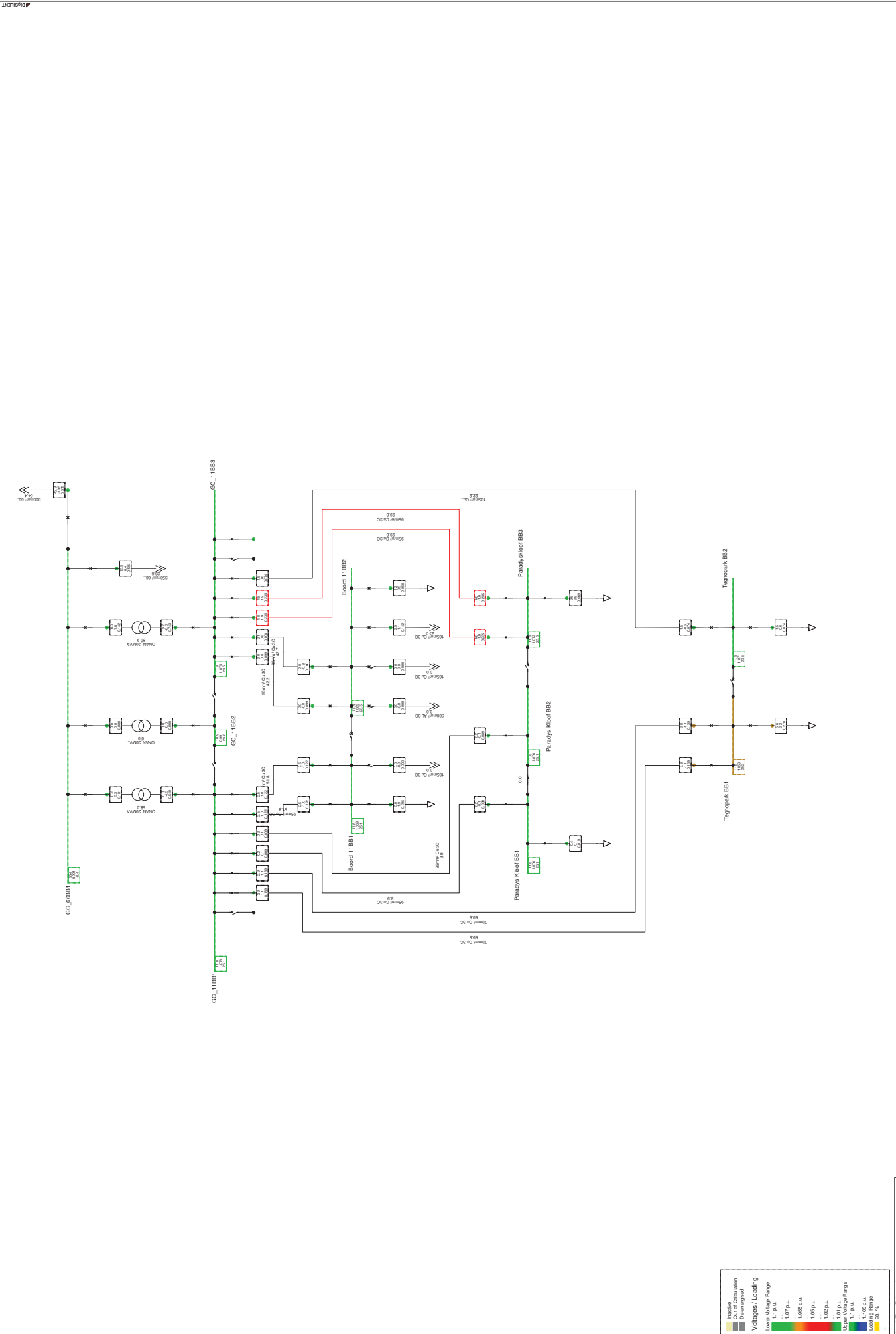
- 1.07 p.u.
- 1.085 p.u.
- 1.09 p.u.
- 1.095 p.u.
- 1.1 p.u.
- 1.105 p.u.
- 1.11 p.u.
- 1.12 p.u.
- 1.13 p.u.
- 1.14 p.u.
- 1.15 p.u.
- 1.16 p.u.
- 1.17 p.u.
- 1.18 p.u.
- 1.19 p.u.
- 1.2 p.u.
- 1.21 p.u.
- 1.22 p.u.
- 1.23 p.u.
- 1.24 p.u.
- 1.25 p.u.
- 1.26 p.u.
- 1.27 p.u.
- 1.28 p.u.
- 1.29 p.u.
- 1.3 p.u.
- 1.31 p.u.
- 1.32 p.u.
- 1.33 p.u.
- 1.34 p.u.
- 1.35 p.u.
- 1.36 p.u.
- 1.37 p.u.
- 1.38 p.u.
- 1.39 p.u.
- 1.4 p.u.
- 1.41 p.u.
- 1.42 p.u.
- 1.43 p.u.
- 1.44 p.u.
- 1.45 p.u.
- 1.46 p.u.
- 1.47 p.u.
- 1.48 p.u.
- 1.49 p.u.
- 1.5 p.u.
- 1.51 p.u.
- 1.52 p.u.
- 1.53 p.u.
- 1.54 p.u.
- 1.55 p.u.
- 1.56 p.u.
- 1.57 p.u.
- 1.58 p.u.
- 1.59 p.u.
- 1.6 p.u.
- 1.61 p.u.
- 1.62 p.u.
- 1.63 p.u.
- 1.64 p.u.
- 1.65 p.u.
- 1.66 p.u.
- 1.67 p.u.
- 1.68 p.u.
- 1.69 p.u.
- 1.7 p.u.
- 1.71 p.u.
- 1.72 p.u.
- 1.73 p.u.
- 1.74 p.u.
- 1.75 p.u.
- 1.76 p.u.
- 1.77 p.u.
- 1.78 p.u.
- 1.79 p.u.
- 1.8 p.u.
- 1.81 p.u.
- 1.82 p.u.
- 1.83 p.u.
- 1.84 p.u.
- 1.85 p.u.
- 1.86 p.u.
- 1.87 p.u.
- 1.88 p.u.
- 1.89 p.u.
- 1.9 p.u.
- 1.91 p.u.
- 1.92 p.u.
- 1.93 p.u.
- 1.94 p.u.
- 1.95 p.u.
- 1.96 p.u.
- 1.97 p.u.
- 1.98 p.u.
- 1.99 p.u.
- 2 p.u.

Upper Voltage Range

- 1.1 p.u.
- 1.105 p.u.
- 1.11 p.u.
- 1.115 p.u.
- 1.12 p.u.
- 1.125 p.u.
- 1.13 p.u.
- 1.135 p.u.
- 1.14 p.u.
- 1.145 p.u.
- 1.15 p.u.
- 1.155 p.u.
- 1.16 p.u.
- 1.165 p.u.
- 1.17 p.u.
- 1.175 p.u.
- 1.18 p.u.
- 1.185 p.u.
- 1.19 p.u.
- 1.195 p.u.
- 1.2 p.u.
- 1.205 p.u.
- 1.21 p.u.
- 1.215 p.u.
- 1.22 p.u.
- 1.225 p.u.
- 1.23 p.u.
- 1.235 p.u.
- 1.24 p.u.
- 1.245 p.u.
- 1.25 p.u.
- 1.255 p.u.
- 1.26 p.u.
- 1.265 p.u.
- 1.27 p.u.
- 1.275 p.u.
- 1.28 p.u.
- 1.285 p.u.
- 1.29 p.u.
- 1.295 p.u.
- 1.3 p.u.
- 1.305 p.u.
- 1.31 p.u.
- 1.315 p.u.
- 1.32 p.u.
- 1.325 p.u.
- 1.33 p.u.
- 1.335 p.u.
- 1.34 p.u.
- 1.345 p.u.
- 1.35 p.u.
- 1.355 p.u.
- 1.36 p.u.
- 1.365 p.u.
- 1.37 p.u.
- 1.375 p.u.
- 1.38 p.u.
- 1.385 p.u.
- 1.39 p.u.
- 1.395 p.u.
- 1.4 p.u.
- 1.405 p.u.
- 1.41 p.u.
- 1.415 p.u.
- 1.42 p.u.
- 1.425 p.u.
- 1.43 p.u.
- 1.435 p.u.
- 1.44 p.u.
- 1.445 p.u.
- 1.45 p.u.
- 1.455 p.u.
- 1.46 p.u.
- 1.465 p.u.
- 1.47 p.u.
- 1.475 p.u.
- 1.48 p.u.
- 1.485 p.u.
- 1.49 p.u.
- 1.495 p.u.
- 1.5 p.u.
- 1.505 p.u.
- 1.51 p.u.
- 1.515 p.u.
- 1.52 p.u.
- 1.525 p.u.
- 1.53 p.u.
- 1.535 p.u.
- 1.54 p.u.
- 1.545 p.u.
- 1.55 p.u.
- 1.555 p.u.
- 1.56 p.u.
- 1.565 p.u.
- 1.57 p.u.
- 1.575 p.u.
- 1.58 p.u.
- 1.585 p.u.
- 1.59 p.u.
- 1.595 p.u.
- 1.6 p.u.
- 1.605 p.u.
- 1.61 p.u.
- 1.615 p.u.
- 1.62 p.u.
- 1.625 p.u.
- 1.63 p.u.
- 1.635 p.u.
- 1.64 p.u.
- 1.645 p.u.
- 1.65 p.u.
- 1.655 p.u.
- 1.66 p.u.
- 1.665 p.u.
- 1.67 p.u.
- 1.675 p.u.
- 1.68 p.u.
- 1.685 p.u.
- 1.69 p.u.
- 1.695 p.u.
- 1.7 p.u.
- 1.705 p.u.
- 1.71 p.u.
- 1.715 p.u.
- 1.72 p.u.
- 1.725 p.u.
- 1.73 p.u.
- 1.735 p.u.
- 1.74 p.u.
- 1.745 p.u.
- 1.75 p.u.
- 1.755 p.u.
- 1.76 p.u.
- 1.765 p.u.
- 1.77 p.u.
- 1.775 p.u.
- 1.78 p.u.
- 1.785 p.u.
- 1.79 p.u.
- 1.795 p.u.
- 1.8 p.u.
- 1.805 p.u.
- 1.81 p.u.
- 1.815 p.u.
- 1.82 p.u.
- 1.825 p.u.
- 1.83 p.u.
- 1.835 p.u.
- 1.84 p.u.
- 1.845 p.u.
- 1.85 p.u.
- 1.855 p.u.
- 1.86 p.u.
- 1.865 p.u.
- 1.87 p.u.
- 1.875 p.u.
- 1.88 p.u.
- 1.885 p.u.
- 1.89 p.u.
- 1.895 p.u.
- 1.9 p.u.
- 1.905 p.u.
- 1.91 p.u.
- 1.915 p.u.
- 1.92 p.u.
- 1.925 p.u.
- 1.93 p.u.
- 1.935 p.u.
- 1.94 p.u.
- 1.945 p.u.
- 1.95 p.u.
- 1.955 p.u.
- 1.96 p.u.
- 1.965 p.u.
- 1.97 p.u.
- 1.975 p.u.
- 1.98 p.u.
- 1.985 p.u.
- 1.99 p.u.
- 2 p.u.

**Load Flow Balancing**

Nodes	Branches
Line-Line Voltage, Magnitude (kV)	Apparent Power (MVA)
Voltage, Magnitude (p.u.)	Reactive Power (Mvar)
Voltage, Angle (deg)	Current, Magnitude (kA)



**Legend**

- Inactive
- Out of Calculation
- Not in Scope
- Not in Diagram

**Voltages / Loading**

Lower Voltage Range

- 1.07 p.u.
- 1.065 p.u.
- 1.06 p.u.
- 1.055 p.u.
- 1.05 p.u.
- 1.045 p.u.
- 1.04 p.u.
- 1.035 p.u.
- 1.03 p.u.
- 1.025 p.u.
- 1.02 p.u.
- 1.015 p.u.
- 1.01 p.u.
- 1.005 p.u.
- 1.00 p.u.

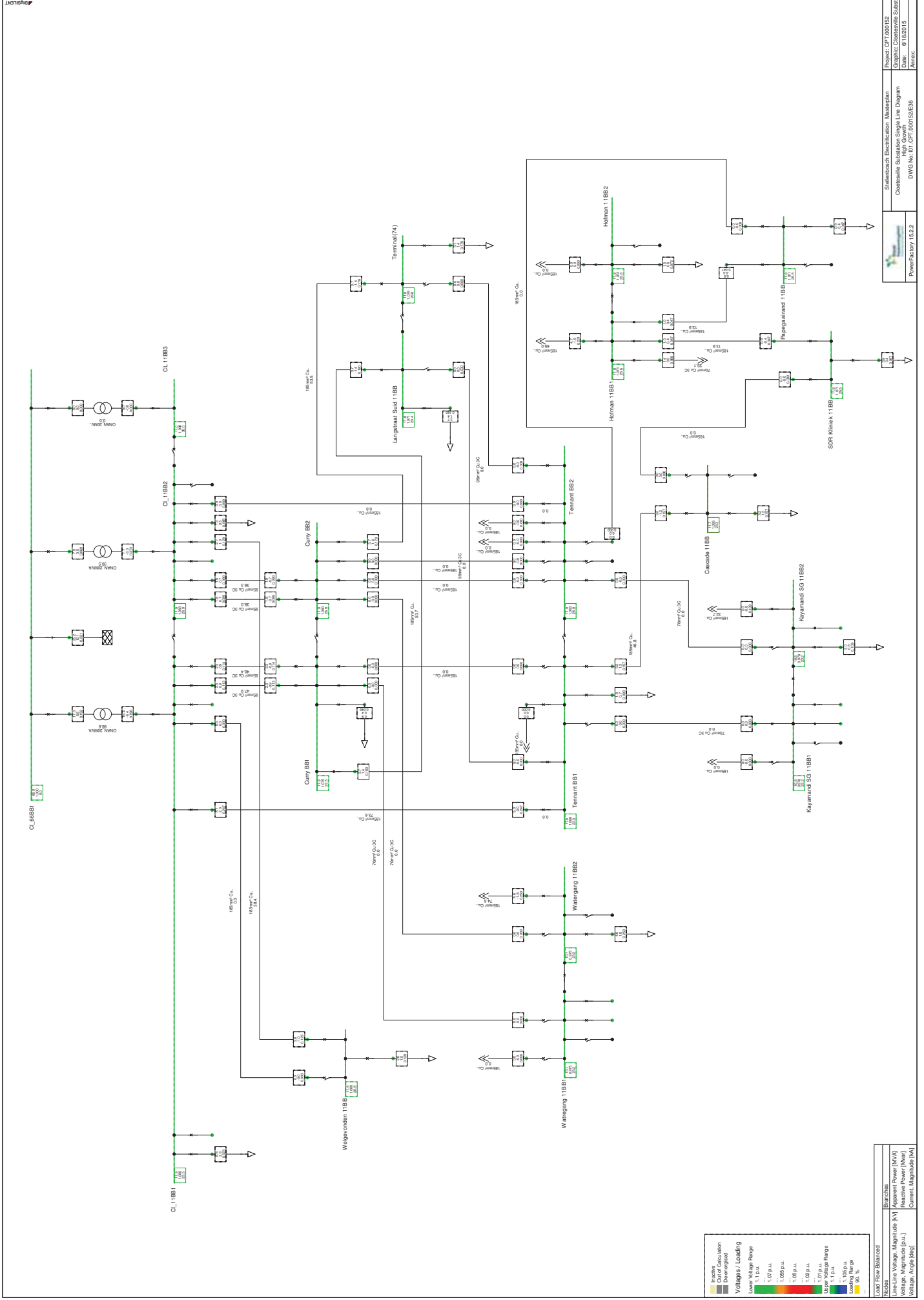
Upper Voltage Range

- 1.01 p.u.
- 1.015 p.u.
- 1.02 p.u.
- 1.025 p.u.
- 1.03 p.u.
- 1.035 p.u.
- 1.04 p.u.
- 1.045 p.u.
- 1.05 p.u.
- 1.055 p.u.
- 1.06 p.u.
- 1.065 p.u.
- 1.07 p.u.

**Load Flow Balancing**

**Notes**

- Line-Line Voltage, Magnitude [kV]
- Line-Line Voltage, Magnitude [p.u.]
- Line-Line Voltage, Angle [deg]
- Apparent Power [MVA]
- Apparent Power [MW]
- Reactive Power [MVar]
- Reactive Power [MVar]
- Current, Magnitude [kA]
- Current, Magnitude [p.u.]
- Current, Angle [deg]



**Legend**

- Inactive (Grey box)
- Out of Operation (Yellow box)
- Breaker (Symbol)
- Voltages / Lending (Color scale)
- Lower Voltage Range (Color scale)
- Upper Voltage Range (Color scale)

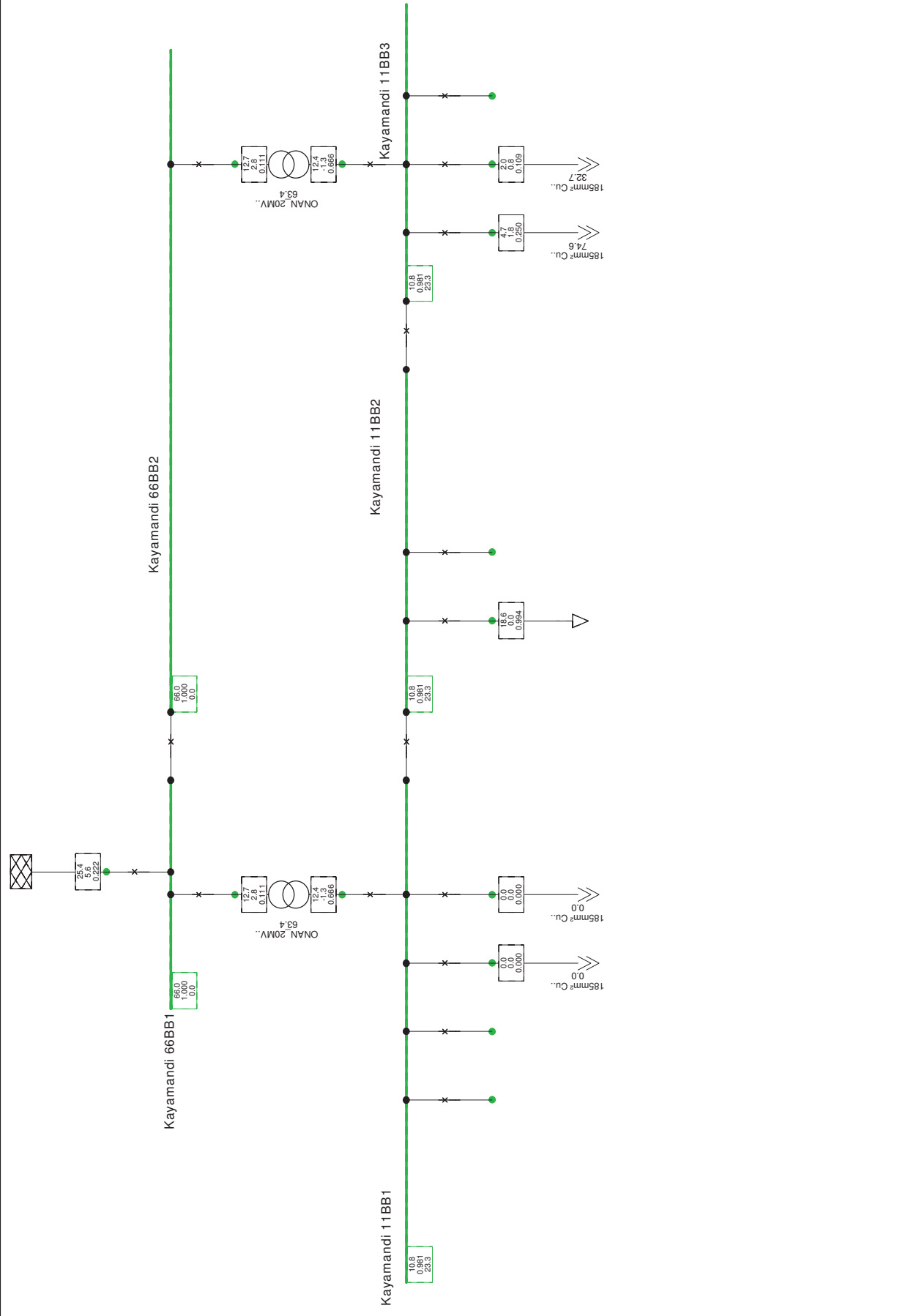
**Notes**

Line-Line Voltage, Magnitude [kV]	Apparent Power [MVA]	Reactive Power [Mvar]
Voltage, Magnitude [p.u.]	Apparent Power [MVA]	Reactive Power [Mvar]
Voltage, Angle [deg]	Current, Magnitude [kA]	Current, Angle [deg]

**Project Information**

Project: CPT 000132	Stasiun Identification: Mapeplan
Graphic: Cirebonville Subst	Cirebonville Substation Single Line Diagram
Date: 6/19/2015	DWG No. 31_CPT_000132_E36
Area:	PowerFactory 13.2.2

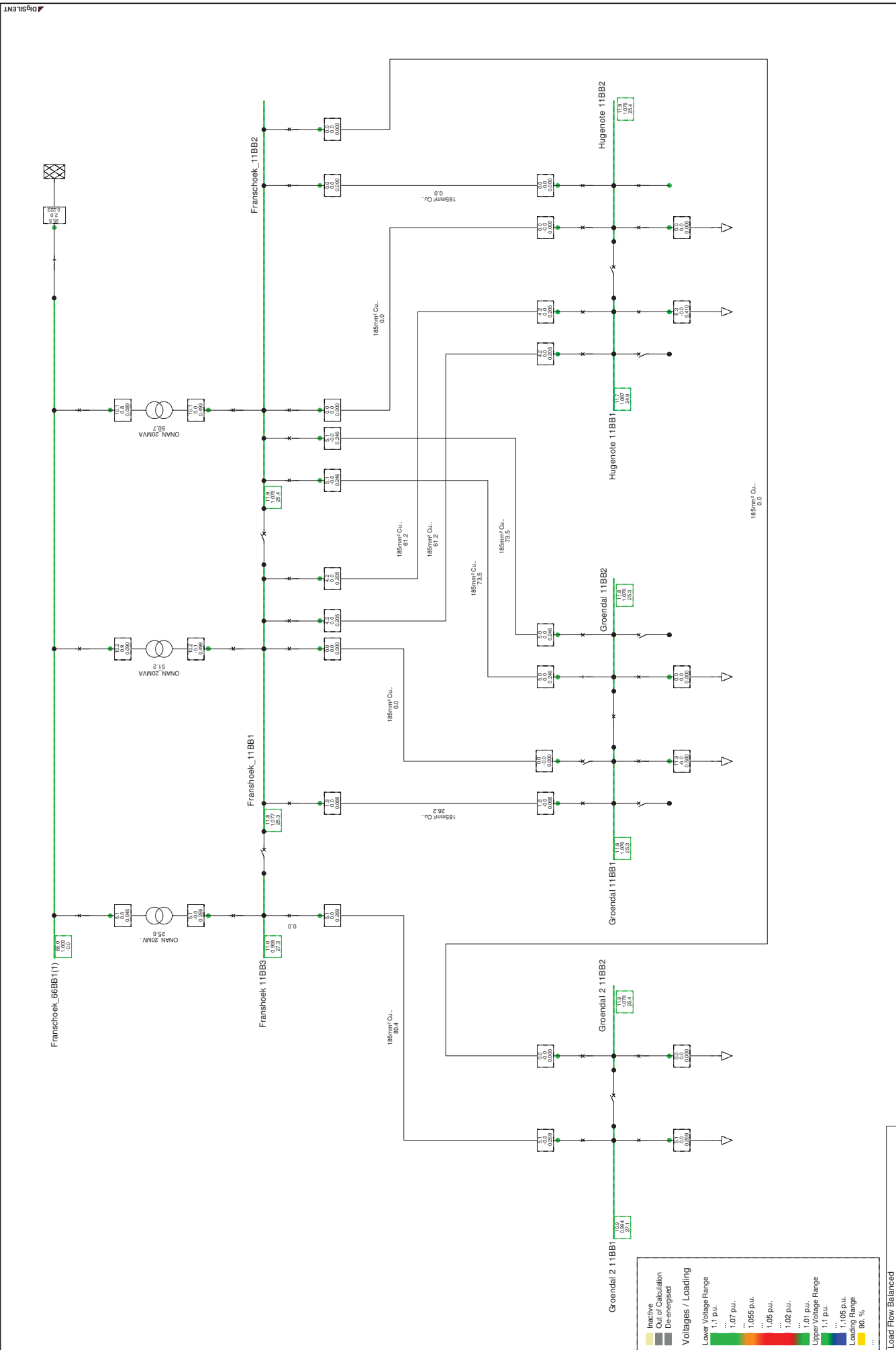




Load Flow Balanced	
Nodes	Branches
Line-Line Voltage, Magnitude [kV]	Apparent Power [MVA]
Voltage, Magnitude [p.u.]	Reactive Power [Mvar]
Voltage, Angle [deg]	Current, Magnitude [kA]

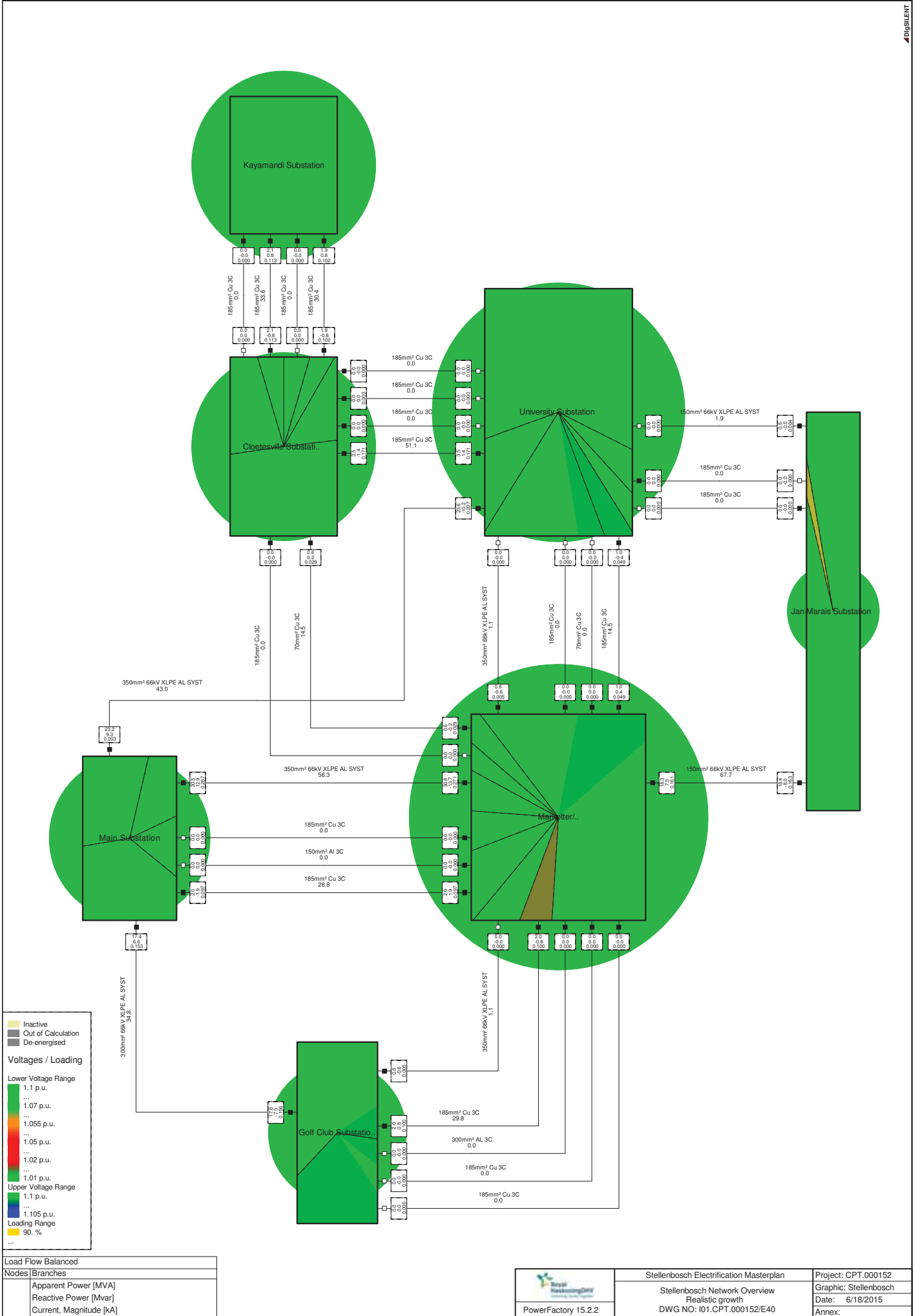
		Stellenbosch Electrification Masterplan Kayamandi Single Line Diagram High Growth DWG No: I01.CPT.000152/E37
PowerFactory 15.2.2		Project: CPT.000152 Graphic: Kayamandi Subst Date: 6/18/2015 Annex:



Load Flow Balanced	
Nodes	Branches
Line-Line Voltage, Magnitude [kV]	Apparent Power [MVA]
Voltage, Magnitude [p.u.]	Reactive Power [Mvar]
Voltage, Angle [deg]	Current, Magnitude [kA]

Project: CPT.000152	Stellenbosch Electrification Masterplan
Graphic: Franschoek	Franschoek Single Line Diagram
Date: 6/18/2015	High Growth
Annex:	DWG No: 01.CPT.000152/E38
	PowerFactory 15.2.2

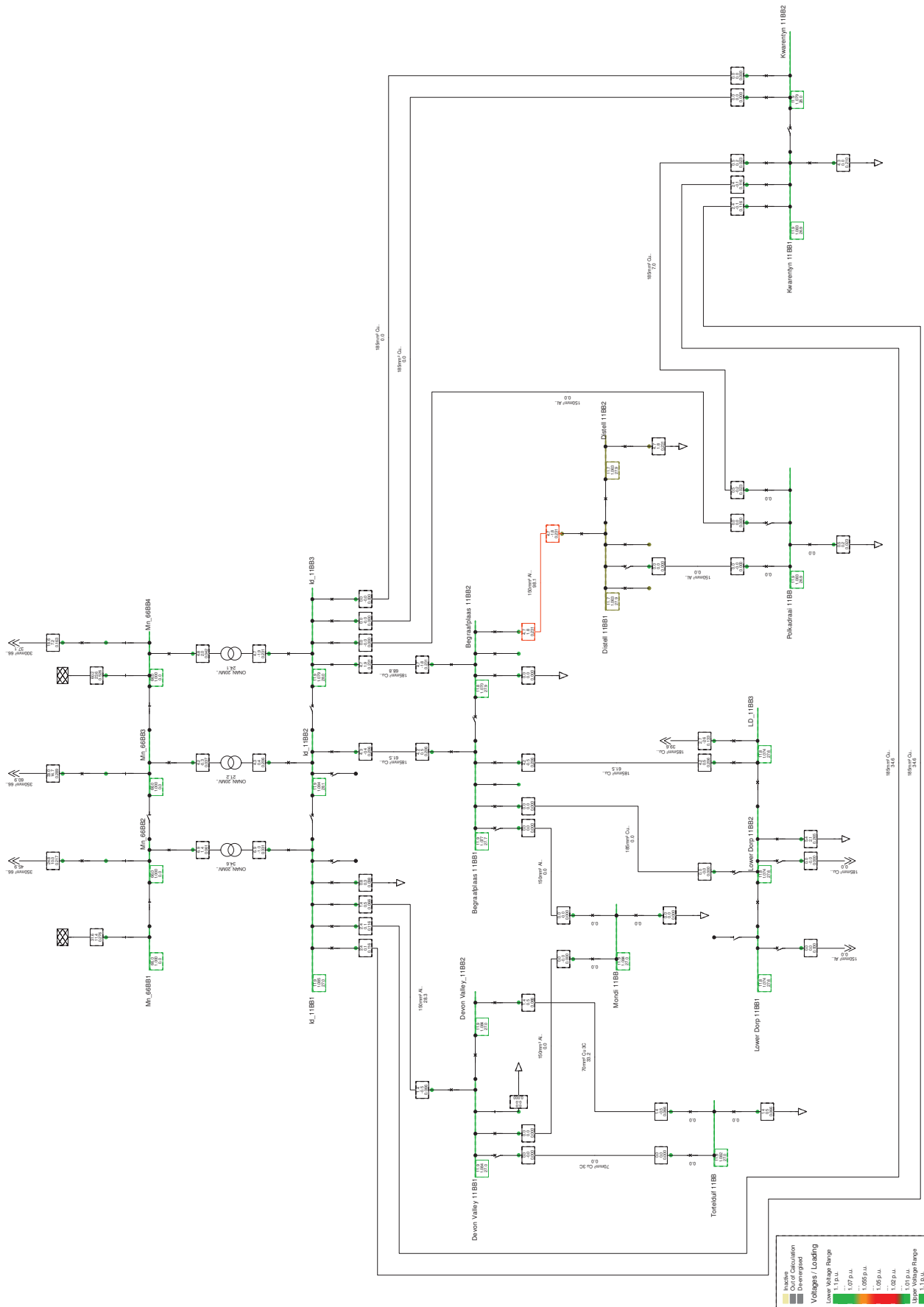


Load Flow Balanced	
Nodes / Branches	
Apparent Power [MVA]	
Reactive Power [Mvar]	
Current, Magnitude [kA]	



Stellenbosch Electrification Masterplan  
 Stellenbosch Network Overview  
 Realistic growth  
 DWG NO: I01.CPT.000152/E40

Project: CPT.000152  
 Graphic: Stellenbosch  
 Date: 6/18/2015  
 Annex:



**Legend**

- Inactive
- Out of Calculation
- Line in Operation
- Line out of Operation

**Voltages / Loading**

Lower Voltage Range

- 1.07 p.u.
- 1.065 p.u.
- 1.06 p.u.
- 1.055 p.u.
- 1.05 p.u.
- 1.045 p.u.
- 1.04 p.u.
- 1.035 p.u.
- 1.03 p.u.
- 1.025 p.u.
- 1.02 p.u.
- 1.015 p.u.
- 1.01 p.u.
- 1.005 p.u.
- 1.00 p.u.

Upper Voltage Range

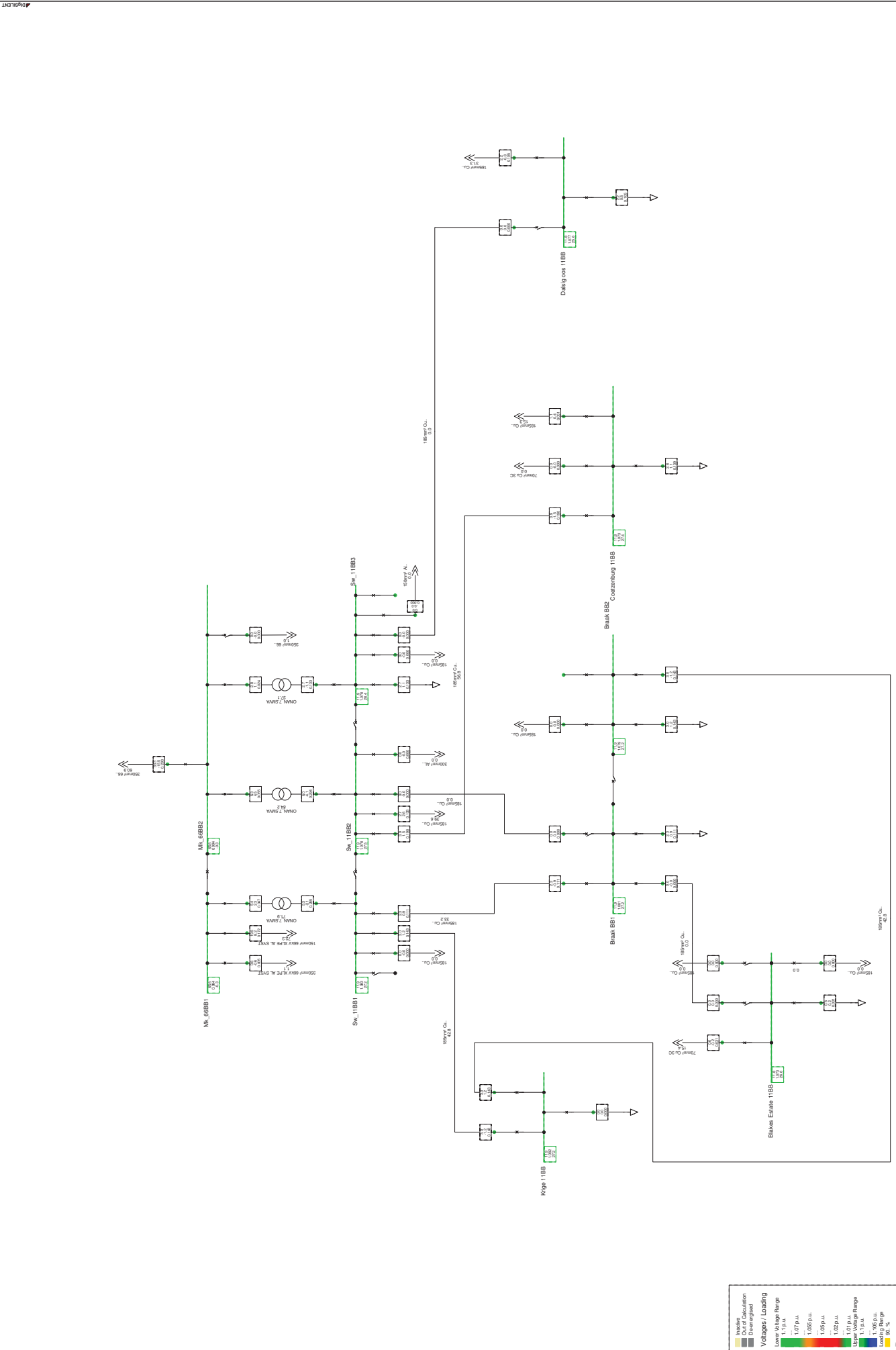
- 1.005 p.u.
- 1.01 p.u.
- 1.015 p.u.
- 1.02 p.u.
- 1.025 p.u.
- 1.03 p.u.
- 1.035 p.u.
- 1.04 p.u.
- 1.045 p.u.
- 1.05 p.u.
- 1.055 p.u.
- 1.06 p.u.
- 1.065 p.u.
- 1.07 p.u.

**Current Magnitude (kA)**

- 0.00
- 0.05
- 0.10
- 0.15
- 0.20
- 0.25
- 0.30
- 0.35
- 0.40
- 0.45
- 0.50
- 0.55
- 0.60
- 0.65
- 0.70
- 0.75
- 0.80
- 0.85
- 0.90
- 0.95
- 1.00
- 1.05
- 1.10
- 1.15
- 1.20
- 1.25
- 1.30
- 1.35
- 1.40
- 1.45
- 1.50
- 1.55
- 1.60
- 1.65
- 1.70
- 1.75
- 1.80
- 1.85
- 1.90
- 1.95
- 2.00

**Load Flow Summary**

Bus	Line Voltage (kV)	Apparent Power (MVA)	Reactive Power (Mvar)	Voltage Magnitude (p.u.)	Current Magnitude (kA)
Devon Valley 11BB1	110	1.00	0.00	1.00	0.00
Doreen Valley 11BB2	110	1.00	0.00	1.00	0.00
Mondri 11BBP	110	1.00	0.00	1.00	0.00
Tonekela 11BB	110	1.00	0.00	1.00	0.00
Lower Dorep 11BB2	110	1.00	0.00	1.00	0.00
LD 11BBB3	110	1.00	0.00	1.00	0.00
Polokwane 11BBP	110	1.00	0.00	1.00	0.00
Kwaremyin 11BB1	110	1.00	0.00	1.00	0.00
Kwaremyin 11BB2	110	1.00	0.00	1.00	0.00



**Legend**

- Inactive
- Out of Calculation
- Not in Scope

**Voltages / Loading**

Lower Voltage Range

- 1.07 p.u.
- 1.065 p.u.
- 1.06 p.u.
- 1.055 p.u.
- 1.05 p.u.
- 1.045 p.u.
- 1.04 p.u.
- 1.035 p.u.
- 1.03 p.u.
- 1.025 p.u.
- 1.02 p.u.
- 1.015 p.u.
- 1.01 p.u.
- 1.005 p.u.
- 1.00 p.u.

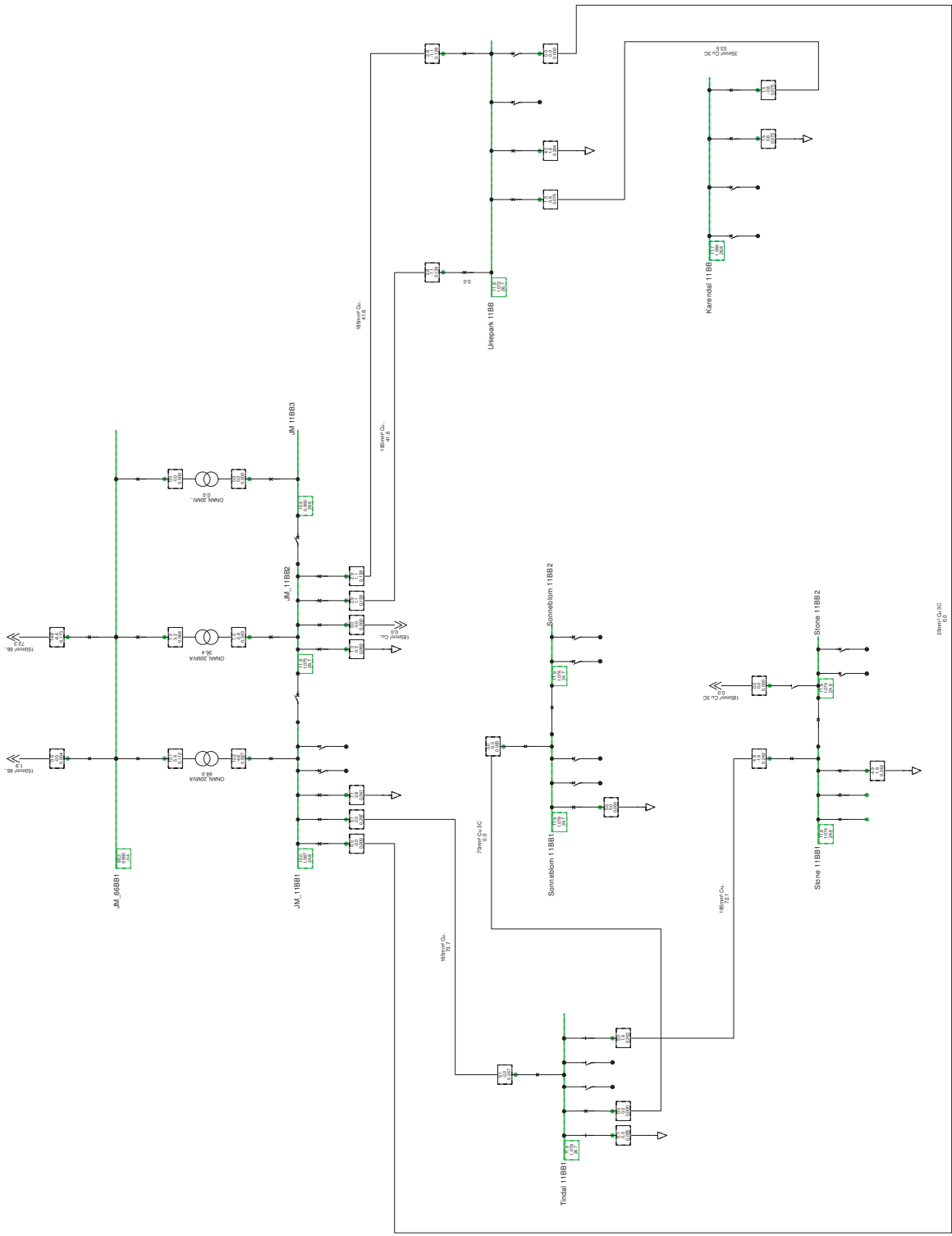
Upper Voltage Range

- 1.005 p.u.
- 1.01 p.u.
- 1.015 p.u.
- 1.02 p.u.
- 1.025 p.u.
- 1.03 p.u.
- 1.035 p.u.
- 1.04 p.u.
- 1.045 p.u.
- 1.05 p.u.
- 1.055 p.u.
- 1.06 p.u.
- 1.065 p.u.
- 1.07 p.u.

**Load Flow Summary**

Busbar	Branches	Line-Line Voltage, Magnitude [kV]	Apparent Power [MVA]	Reactive Power [MVar]	Voltage, Magnitude [p.u.]	Voltage, Angle [deg]	Current, Magnitude [kA]





**Legend**

- Inactive
- Out of Calculation
- Not in the scope
- Not in the scope

**Voltages / Loading**

Lower Voltage Range

- 1.07 p.u.
- 1.085 p.u.
- 1.09 p.u.
- 1.095 p.u.
- 1.1 p.u.
- 1.105 p.u.
- 1.11 p.u.
- 1.125 p.u.
- 1.13 p.u.
- 1.14 p.u.
- 1.15 p.u.
- 1.16 p.u.
- 1.17 p.u.
- 1.18 p.u.
- 1.19 p.u.
- 1.2 p.u.
- 1.21 p.u.
- 1.22 p.u.
- 1.23 p.u.
- 1.24 p.u.
- 1.25 p.u.
- 1.26 p.u.
- 1.27 p.u.
- 1.28 p.u.
- 1.29 p.u.
- 1.3 p.u.
- 1.31 p.u.
- 1.32 p.u.
- 1.33 p.u.
- 1.34 p.u.
- 1.35 p.u.
- 1.36 p.u.
- 1.37 p.u.
- 1.38 p.u.
- 1.39 p.u.
- 1.4 p.u.
- 1.41 p.u.
- 1.42 p.u.
- 1.43 p.u.
- 1.44 p.u.
- 1.45 p.u.
- 1.46 p.u.
- 1.47 p.u.
- 1.48 p.u.
- 1.49 p.u.
- 1.5 p.u.
- 1.51 p.u.
- 1.52 p.u.
- 1.53 p.u.
- 1.54 p.u.
- 1.55 p.u.
- 1.56 p.u.
- 1.57 p.u.
- 1.58 p.u.
- 1.59 p.u.
- 1.6 p.u.
- 1.61 p.u.
- 1.62 p.u.
- 1.63 p.u.
- 1.64 p.u.
- 1.65 p.u.
- 1.66 p.u.
- 1.67 p.u.
- 1.68 p.u.
- 1.69 p.u.
- 1.7 p.u.
- 1.71 p.u.
- 1.72 p.u.
- 1.73 p.u.
- 1.74 p.u.
- 1.75 p.u.
- 1.76 p.u.
- 1.77 p.u.
- 1.78 p.u.
- 1.79 p.u.
- 1.8 p.u.
- 1.81 p.u.
- 1.82 p.u.
- 1.83 p.u.
- 1.84 p.u.
- 1.85 p.u.
- 1.86 p.u.
- 1.87 p.u.
- 1.88 p.u.
- 1.89 p.u.
- 1.9 p.u.
- 1.91 p.u.
- 1.92 p.u.
- 1.93 p.u.
- 1.94 p.u.
- 1.95 p.u.
- 1.96 p.u.
- 1.97 p.u.
- 1.98 p.u.
- 1.99 p.u.
- 2 p.u.

**Upper Voltage Range**

- 1.1 p.u.
- 1.105 p.u.
- 1.11 p.u.
- 1.115 p.u.
- 1.12 p.u.
- 1.125 p.u.
- 1.13 p.u.
- 1.135 p.u.
- 1.14 p.u.
- 1.145 p.u.
- 1.15 p.u.
- 1.155 p.u.
- 1.16 p.u.
- 1.165 p.u.
- 1.17 p.u.
- 1.175 p.u.
- 1.18 p.u.
- 1.185 p.u.
- 1.19 p.u.
- 1.195 p.u.
- 1.2 p.u.
- 1.205 p.u.
- 1.21 p.u.
- 1.215 p.u.
- 1.22 p.u.
- 1.225 p.u.
- 1.23 p.u.
- 1.235 p.u.
- 1.24 p.u.
- 1.245 p.u.
- 1.25 p.u.
- 1.255 p.u.
- 1.26 p.u.
- 1.265 p.u.
- 1.27 p.u.
- 1.275 p.u.
- 1.28 p.u.
- 1.285 p.u.
- 1.29 p.u.
- 1.295 p.u.
- 1.3 p.u.
- 1.305 p.u.
- 1.31 p.u.
- 1.315 p.u.
- 1.32 p.u.
- 1.325 p.u.
- 1.33 p.u.
- 1.335 p.u.
- 1.34 p.u.
- 1.345 p.u.
- 1.35 p.u.
- 1.355 p.u.
- 1.36 p.u.
- 1.365 p.u.
- 1.37 p.u.
- 1.375 p.u.
- 1.38 p.u.
- 1.385 p.u.
- 1.39 p.u.
- 1.395 p.u.
- 1.4 p.u.
- 1.405 p.u.
- 1.41 p.u.
- 1.415 p.u.
- 1.42 p.u.
- 1.425 p.u.
- 1.43 p.u.
- 1.435 p.u.
- 1.44 p.u.
- 1.445 p.u.
- 1.45 p.u.
- 1.455 p.u.
- 1.46 p.u.
- 1.465 p.u.
- 1.47 p.u.
- 1.475 p.u.
- 1.48 p.u.
- 1.485 p.u.
- 1.49 p.u.
- 1.495 p.u.
- 1.5 p.u.
- 1.505 p.u.
- 1.51 p.u.
- 1.515 p.u.
- 1.52 p.u.
- 1.525 p.u.
- 1.53 p.u.
- 1.535 p.u.
- 1.54 p.u.
- 1.545 p.u.
- 1.55 p.u.
- 1.555 p.u.
- 1.56 p.u.
- 1.565 p.u.
- 1.57 p.u.
- 1.575 p.u.
- 1.58 p.u.
- 1.585 p.u.
- 1.59 p.u.
- 1.595 p.u.
- 1.6 p.u.
- 1.605 p.u.
- 1.61 p.u.
- 1.615 p.u.
- 1.62 p.u.
- 1.625 p.u.
- 1.63 p.u.
- 1.635 p.u.
- 1.64 p.u.
- 1.645 p.u.
- 1.65 p.u.
- 1.655 p.u.
- 1.66 p.u.
- 1.665 p.u.
- 1.67 p.u.
- 1.675 p.u.
- 1.68 p.u.
- 1.685 p.u.
- 1.69 p.u.
- 1.695 p.u.
- 1.7 p.u.
- 1.705 p.u.
- 1.71 p.u.
- 1.715 p.u.
- 1.72 p.u.
- 1.725 p.u.
- 1.73 p.u.
- 1.735 p.u.
- 1.74 p.u.
- 1.745 p.u.
- 1.75 p.u.
- 1.755 p.u.
- 1.76 p.u.
- 1.765 p.u.
- 1.77 p.u.
- 1.775 p.u.
- 1.78 p.u.
- 1.785 p.u.
- 1.79 p.u.
- 1.795 p.u.
- 1.8 p.u.
- 1.805 p.u.
- 1.81 p.u.
- 1.815 p.u.
- 1.82 p.u.
- 1.825 p.u.
- 1.83 p.u.
- 1.835 p.u.
- 1.84 p.u.
- 1.845 p.u.
- 1.85 p.u.
- 1.855 p.u.
- 1.86 p.u.
- 1.865 p.u.
- 1.87 p.u.
- 1.875 p.u.
- 1.88 p.u.
- 1.885 p.u.
- 1.89 p.u.
- 1.895 p.u.
- 1.9 p.u.
- 1.905 p.u.
- 1.91 p.u.
- 1.915 p.u.
- 1.92 p.u.
- 1.925 p.u.
- 1.93 p.u.
- 1.935 p.u.
- 1.94 p.u.
- 1.945 p.u.
- 1.95 p.u.
- 1.955 p.u.
- 1.96 p.u.
- 1.965 p.u.
- 1.97 p.u.
- 1.975 p.u.
- 1.98 p.u.
- 1.985 p.u.
- 1.99 p.u.
- 2 p.u.

**Load Flow Balancing**

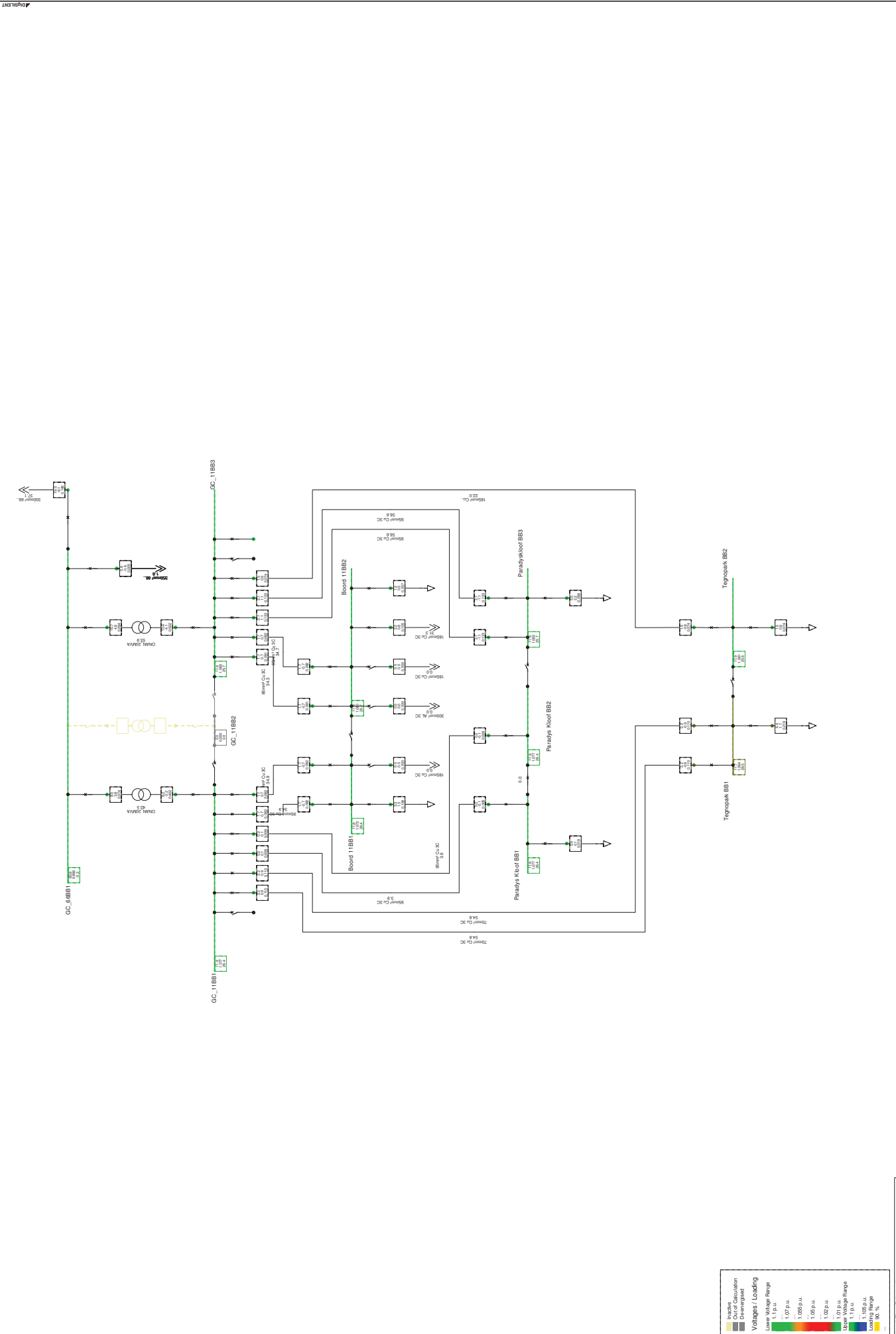
Nodes	Branches
Line-Line Voltage, Magnitude (kV)	Apparent Power (MVA)
Voltage, Magnitude (p.u.)	Reactive Power (Mvar)
Voltage, Angle (deg)	Current, Magnitude (kA)



PowerFactory 13.2.2

Stasiun Elektrifikasi Masterplan  
 Jan Masri Substation Single Line Diagram  
 Realistic Growth  
 DWG No. ST-CPT-03052-E44  
 Rev: 01

Project: CPT.000132  
 Graphic: Jan Masri Sub  
 Date: 01/05/2015  
 Area:



**Legend**

- Inactive
- Out of Operation
- Not in Operation
- Active

**Voltages / Loading**

Lower Voltage Range

- 1.07 p.u.
- 1.065 p.u.
- 1.06 p.u.
- 1.055 p.u.
- 1.05 p.u.
- 1.045 p.u.
- 1.04 p.u.

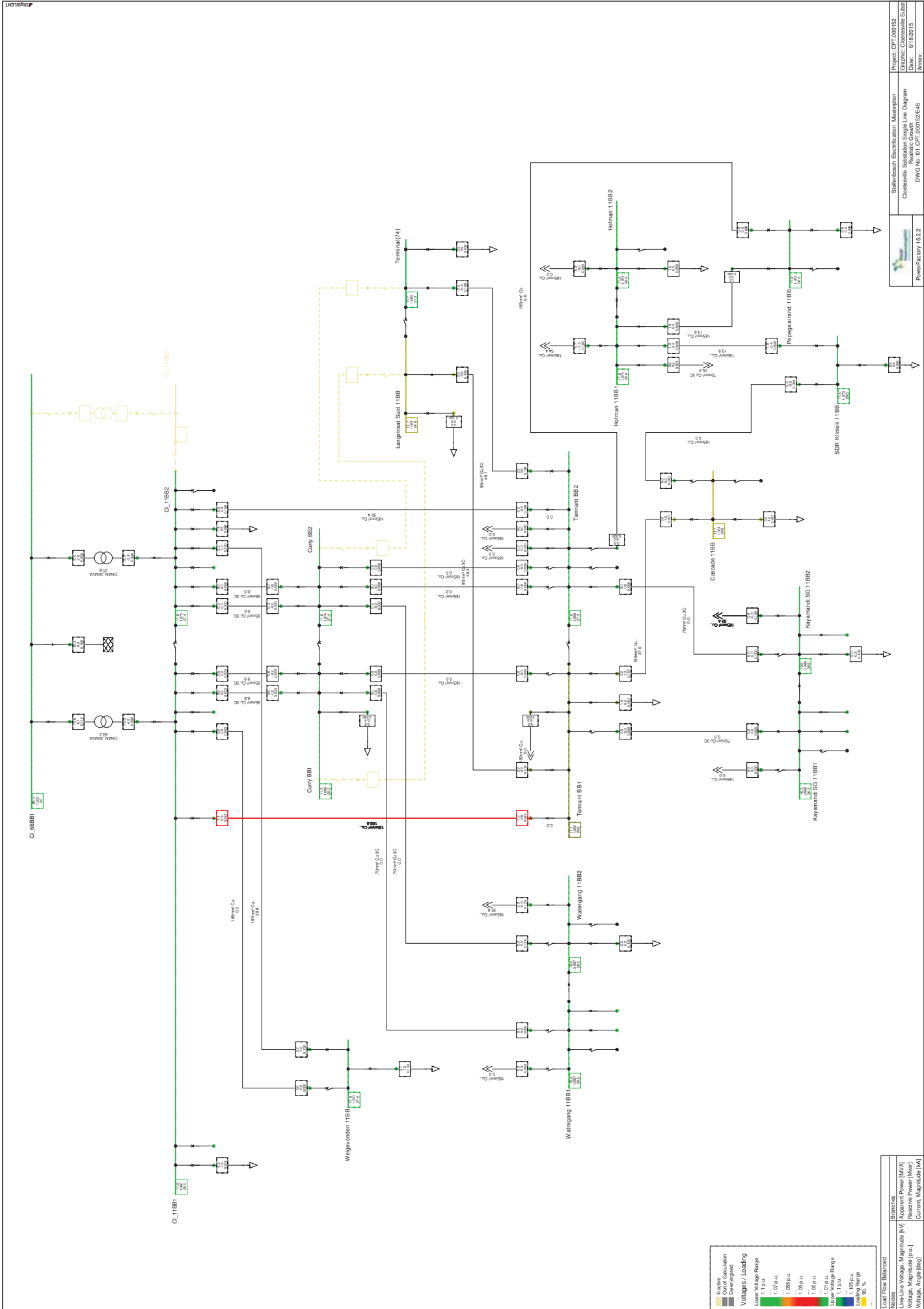
Upper Voltage Range

- 1.1 p.u.
- 1.105 p.u.
- 1.11 p.u.
- 1.115 p.u.
- 1.12 p.u.
- 1.125 p.u.
- 1.13 p.u.
- 1.135 p.u.
- 1.14 p.u.
- 1.145 p.u.
- 1.15 p.u.
- 1.155 p.u.
- 1.16 p.u.
- 1.165 p.u.
- 1.17 p.u.
- 1.175 p.u.
- 1.18 p.u.
- 1.185 p.u.
- 1.19 p.u.
- 1.195 p.u.
- 1.2 p.u.

**Load Flow Balance**

Nodes	Branches
Line-Line Voltage, Magnitude [kV]	Apparent Power [MVA]
Voltage, Magnitude [p.u.]	Reactive Power [Mvar]
Voltage, Angle [deg]	Current, Magnitude [kA]





**Legend**

Inactive  
 Out of Operation  
 In Service / Energized

**Voltages / Loading**

1.00 p.u.  
 1.07 p.u.  
 1.085 p.u.  
 1.09 p.u.  
 1.09 p.u.  
 1.10 p.u.  
 1.11 p.u.  
 1.125 p.u.  
 1.15 p.u.  
 1.20 p.u.  
 1.50 p.u.

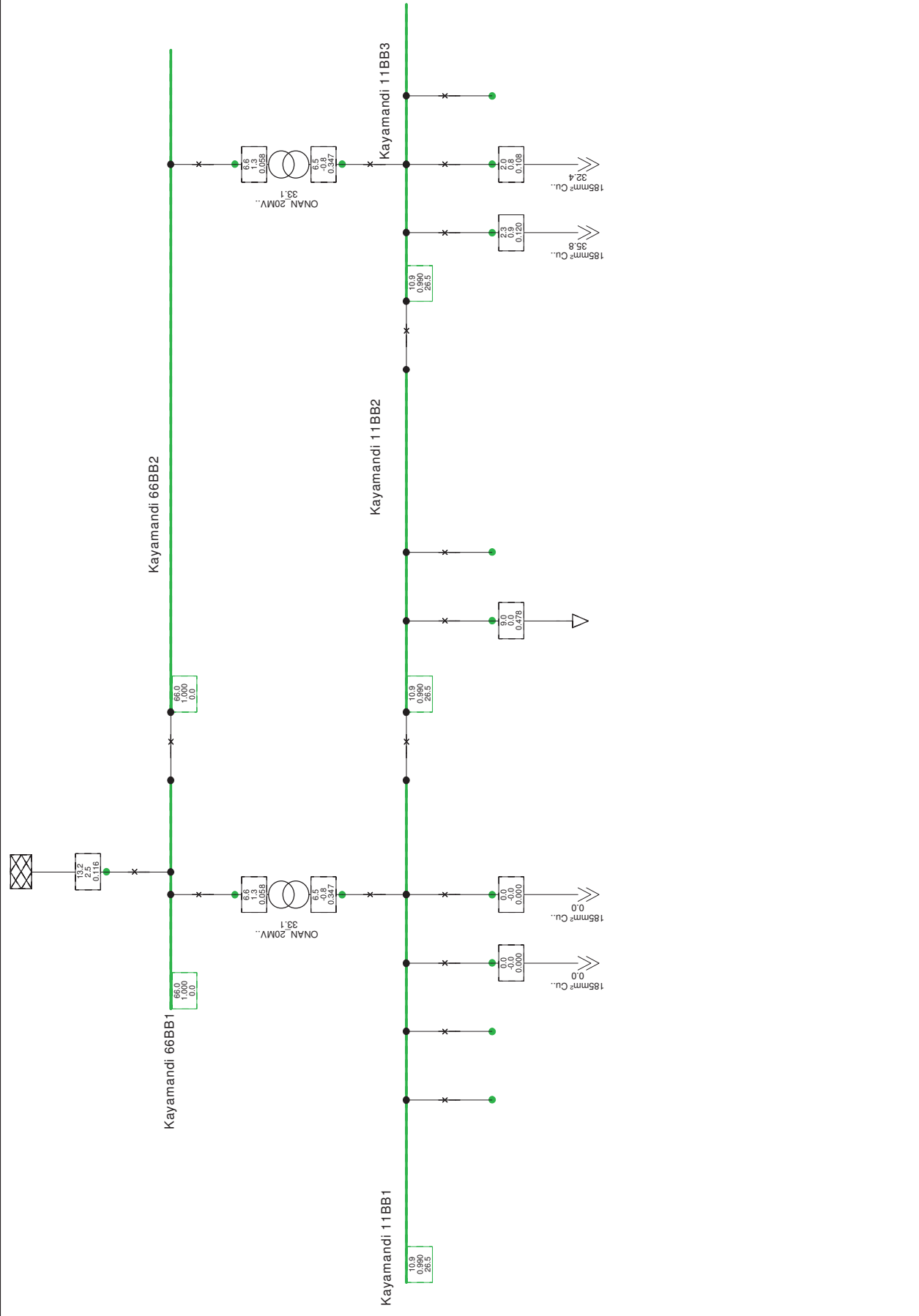
Lower Voltage Range  
 Upper Voltage Range

**Notes**

Line-Line Voltage, Magnitude [kV]  
 Apparent Power [MVA]  
 Voltage, Magnitude [p.u.]  
 Voltage, Angle [deg]

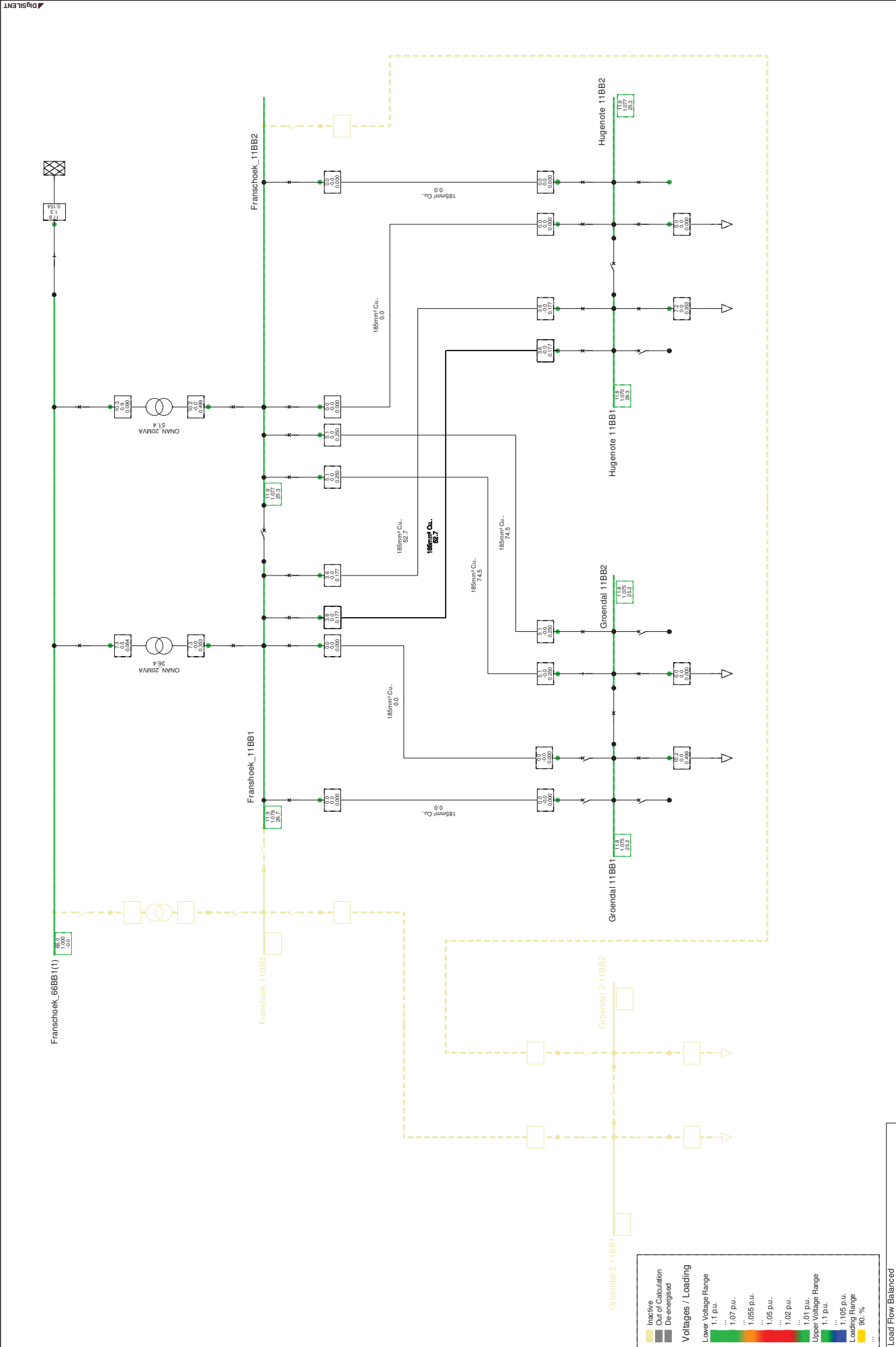
**Load Flow Balance**

Branches	Active Power [MW]	Reactive Power [MVar]	Current, Magnitude [kA]



Load Flow Balanced	
Nodes	Branches
Line-Line Voltage, Magnitude [kV]	Apparent Power [MVA]
Voltage, Magnitude [p.u.]	Reactive Power [Mvar]
Voltage, Angle [deg]	Current, Magnitude [kA]

		Stellenbosch Electrification Masterplan Kayamandi Single Line Diagram Realistic growth DWG No.: 101.CPT.000152/E47
PowerFactory 15.2.2		Project: CPT.000152 Graphic: Kayamandi Subst Date: 6/18/2015 Annex:



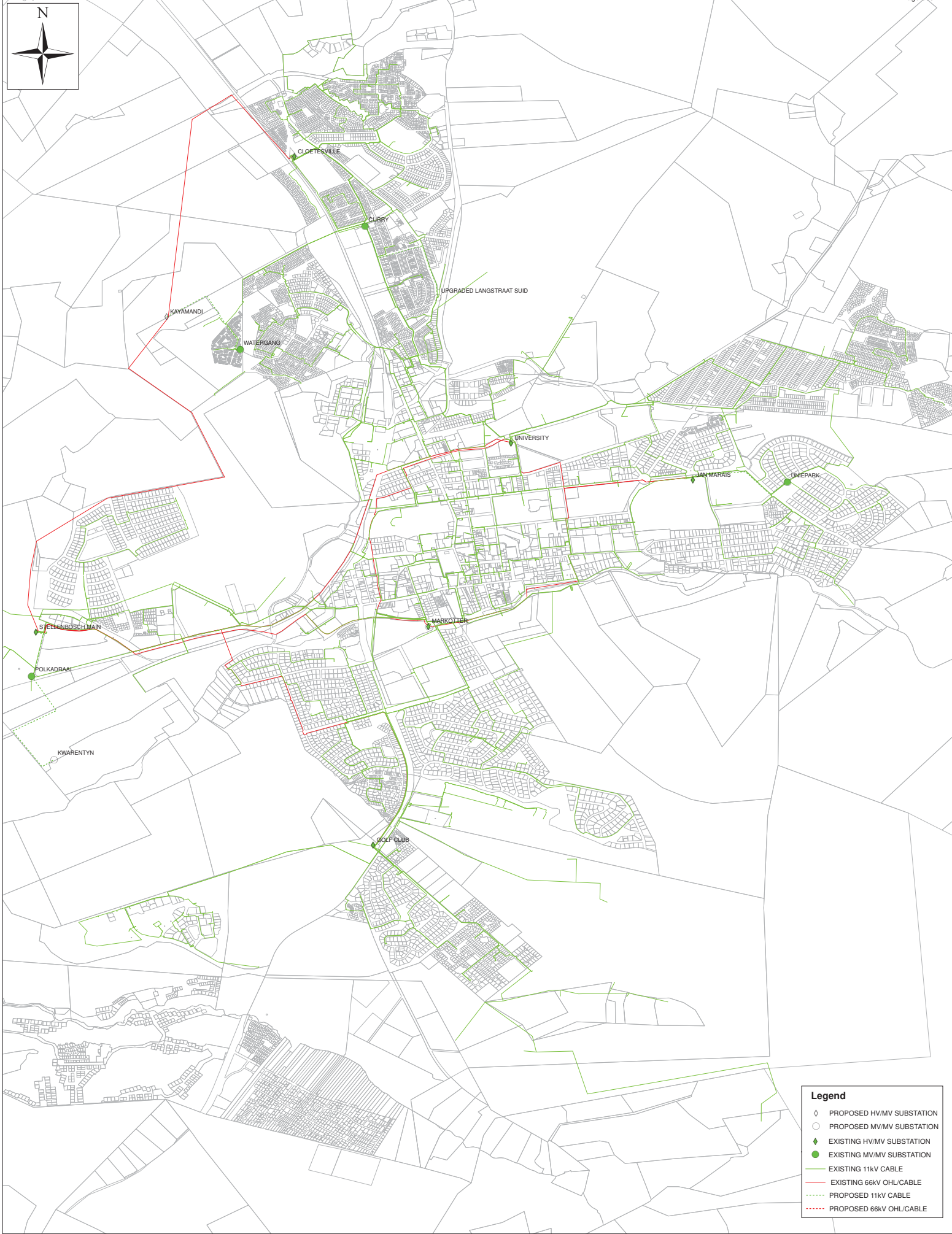
Load Flow Balanced	
Nodes	Branches
Line-Line Voltage, Magnitude [kV]	Apparent Power [MVA]
Voltage, Magnitude [p.u.]	Reactive Power [Mvar]
Voltage, Angle [deg]	Current, Magnitude [kA]

Project: CPT.000152	Stellenbosch Electrification Masterplan
Graphic: Franschhoek	Franschhoek Single Line Diagram
Date: 6/18/2015	Realistic Growth
Amex:	DWG No: 101.CPT.000152/E48
	PowerFactory 15.2.2

## APPENDIX E : NETWORK PLAN LAYOUT DRAWINGS

DRAWING NUMBER	TITLE
I01.CPT.000127/E10	Plan Layout of Network: Stellenbosch (2034)
I01.CPT.000127/E11	Plan Layout of Network: Franschoek (2034)



**Legend**

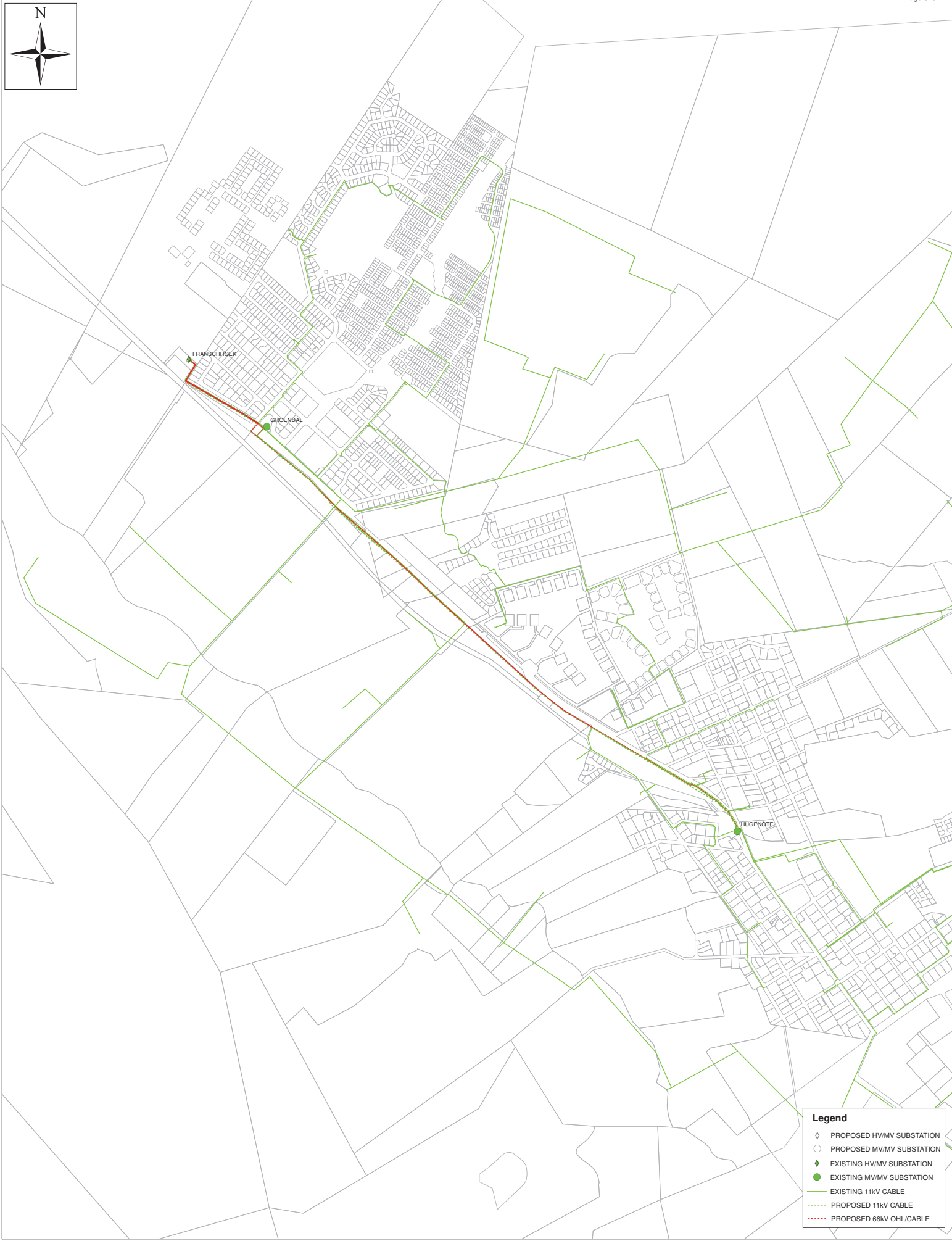
- ◇ PROPOSED HV/MV SUBSTATION
- PROPOSED MV/MV SUBSTATION
- ◆ EXISTING HV/MV SUBSTATION
- EXISTING MV/MV SUBSTATION
- EXISTING 11kV CABLE
- EXISTING 66kV OHL/CABLE
- - - PROPOSED 11kV CABLE
- - - PROPOSED 66kV OHL/CABLE



**STELLENBOSCH MUNICIPALITY ELECTRICAL INFRASTRUCTURE MASTERPLAN:**  
**STELLENBOSCH TOWN: PROPOSED UPGRADES**

SCALE: 1:10 000

I01.CPT.000152/E10 - REV 0



**Legend**

- ◇ PROPOSED HV/MV SUBSTATION
- PROPOSED MV/MV SUBSTATION
- ◆ EXISTING HV/MV SUBSTATION
- EXISTING MV/MV SUBSTATION
- EXISTING 11kV CABLE
- - - PROPOSED 11kV CABLE
- - - PROPOSED 66kV OHL/CABLE



**STELLENBOSCH MUNICIPALITY ELECTRICAL INFRASTRUCTURE MASTERPLAN:**

**FRANSCHHOEK TOWN: PROPOSED UPGRADES**

SCALE: 1:4 000

I01.CPT.000152/E11 - REV 0

**8.4 ELECTRICITY SUPPLY TO THE MUNICIPAL AREAS OF STELLENBOSCH**

*File number* : 8/1 Engineering Services  
*Compiled by* : Acting Manager: Electrical Services  
*Report by* : Acting Director: Engineering Services  
*Delegated Authority* : Council

**Strategic intent of item**

Preferred investment destination	<input checked="" type="checkbox"/>
Greenest municipality	<input type="checkbox"/>
Safest valley	<input type="checkbox"/>
Dignified Living	<input checked="" type="checkbox"/>
Good Governance	<input checked="" type="checkbox"/>

**1. PURPOSE OF THE REPORT**

To provide a progress report with regard to previous questions relating to the supply of electricity in the municipal area of Stellenbosch.

**2. BACKGROUND**

The previous Council item and resolution in this regard, dated 26 November 2014, is attached as **APPENDIX 1**.

Stellenbosch Municipality started with a process to transfer /take over the electricity distribution to the Pniel/Wemmershoek area, historically supplied by Drakenstein Municipality.

**3. DISCUSSION**

The previous resolution required a preliminary investigation to be conducted regarding the taking over of electricity supply from Drakenstein, while also requesting SALGA to expedite talks with ESKOM re other areas.

After various meetings between Drakenstein- and Stellenbosch Municipalities, an item served at Drakenstein Municipality's Council meeting of 29 September 2015. In response to the resolution as attached as **APPENDIX 2**, refer to the Department: Electrical Services' comments below:

**Point 1:**

It is noted that Drakenstein approved the transfer in principle

**Point 2:**

This Department is now waiting on Drakenstein Municipality's quotation for the infrastructure take-over

**Point 3:**

The resale of electricity by Drakenstein Municipality to Stellenbosch Municipality at the Eskom Megaflex tariff is acceptable

**Point 6**

This Directorate now awaits Drakenstein Municipality to provide a quotation to create 2x supply and metering points.

**CONCLUSION**

Although this is a positive move, there are still a few legal aspects to be investigated. Once the quotations have been received, a final decision will be tabled to determine the way forward for Stellenbosch Municipality.

**RECOMMENDED**

that the actions taken and progress made regarding the takeover of the Electricity supply from Drakenstein Municipality, be noted.

**(ACTING DIRECTOR: ENGINEERING  
SERVICES TO ACTION)**

**ENGINEERING SERVICES AND HUMAN SETTLEMENTS COMMITTEE  
MEETING: 2015-11-04: ITEM 5.2.3****RESOLVED** (nem com)

that the actions taken and progress made regarding the takeover of the Electricity supply from Drakenstein Municipality, be noted.

**(ACTING DIRECTOR: ENGINEERING  
SERVICES TO ACTION)**

**FURTHER COMMENTS FROM THE DIRECTOR: ENGINEERING SERVICES**

Further to previous progress on this matter, Drakenstein Council at their meeting held on 20 May 2016 resolved (Resolution attached as **APPENDIX 3**):

1. *That the ceding of the Pniel and Hollandse Molen electricity networks, to Stellenbosch Municipality, **be approved in principle.***
2. *That the negotiations for transfer of existing electrical infrastructure, services and metering be approved in principle and charged to Stellenbosch Municipality, at an estimated asset carrying value of R9 059 664.14 (as at 30 June 2016);*
3. *That it be noted that Drakenstein intends to sell to Stellenbosch bulk electricity at the Eskom Megaflex tariff plus a percentage value between*



*5 and 10%, but legal implications in this regard must be investigated in consultation with NERSA;*

4. *That the financial implications as set out, be noted*
5. *That the legal implications, be noted and*
6. *That the required network, upgrades, new metering points and switchgear be installed at cost to Stellenbosch Municipality”.*

The quotation to install two metering points and accompanied infrastructure was provided by Drakenstein Municipality and is attached as **APPENDIX 4** and amounts to R11 468 012.14 (incl VAT). Drakenstein Municipality has also indicated that a bank guarantee in respect of the consumer deposit of R2 000 000 instead of a cash transfer would be acceptable.

Council approved an amount of R10 300 000 on the 2016/17 budget to fund the amount of R10 059 664.16 (excl VAT).

The program to implement the take-over of the Electricity supply from Drakenstein Municipality is as follows:

1. An agreement will be compiled and signed by both Municipalities;
2. The payment as per the quotation will be made by Stellenbosch Municipality;
3. The affected consumers will be notified of the process to take over the electricity supply from Drakenstein Municipality. These consumers will be charged the tariffs as approved by Stellenbosch Municipality which is not anticipated to be a problem as Stellenbosch Municipality's tariffs are lower than Drakenstein Municipality's;
4. NERSA will be informed of the take-over;
5. The supply points will be installed by Drakenstein Municipality and the transfer of assets and consumers from Drakenstein to Stellenbosch Municipality can be effected simultaneously.

Council is hereby requested to consider the approval of the take-over before the recess by delegating the authority to the acting Municipal Manager to approve and sign off the required agreement and payment to Drakenstein Municipality in order to expedite the final phase of this project.

#### **COMMENTS FROM THE DIRECTORATE: STRATEGIC & CORPORATE SERVICES (LEGAL)**

Refer to the comments provided in Appendix 1

#### **COMMENTS FROM THE DIRECTORATE: FINANCIAL SERVICES**

In the 2016/2017 financial year an amount of R10 300 000 is allocated for the takeover of the electricity distribution in the Pniel/Wemmershoek area.

Before the municipality proceed with the acquisition a cost benefit analysis will be done as part of due diligence in terms of projected revenue and expenditures after the take-over.

It is also to be 2015/16 financial year.

NERSA requested an application from Stellenbosch Municipality regarding the take-over to finalise the details and tariffs applicable after the take-over.

#### **RECOMMENDED**

- (a) that Council take note of the progress made with the take-over of the electricity supply from Drakenstein Municipality;
- (b) that Council delegate the authority to the acting Municipal Manager to sign the agreement, subject to a due diligence; and
- (c) that Council mandate the administration to compile and submit an application to NERSA for the proposed take-over of the electricity network in the Pniel area from Drakenstein Municipality to Stellenbosch Municipality.

**(ACTING DIRECTOR: ENGINEERING  
SERVICES TO ACTION)**

# APPENDIX 1

**7.5 ELECTRICITY SUPPLY TO THE MUNICIPAL AREAS OF STELLENBOSCH**

*File number* : 8/1 Engineering Services  
*Compiled by* : Manager: Electrical Services  
*Report by* : Director: Engineering Services  
*Delegated Authority* : Council

**Strategic intent of item**

Preferred investment destination	<input checked="" type="checkbox"/>
Greenest municipality	<input type="checkbox"/>
Safest valley	<input type="checkbox"/>
Dignified Living	<input checked="" type="checkbox"/>
Good Governance	<input checked="" type="checkbox"/>

---

**1. PURPOSE OF THE REPORT**

To provide clarity and update on the supply of electricity in the municipal area of Stellenbosch.

**2. BACKGROUND**

Since the demarcation in 2000, municipalities are faced with the challenge that they only supply electricity to certain parts of the municipal area (urban areas) while Eskom supplies the rest (rural areas). In Stellenbosch's case, there is even a third supplier namely Drakenstein Municipality, who is supplying Pniel and surrounding areas with electricity.

The most serious challenges that Stellenbosch Municipality encounters are:

- The standard of service delivery differs in the three areas of supply;
- The electricity tariffs differ substantially;
- Stellenbosch Municipality does not receive income from the sales of electricity as is the case in its own supply area; and
- The municipality cannot make use of electricity supply for debt control purposes.

Since the demarcation, the taking over of these areas by the Municipality has been under discussion.

**3. DISCUSSION**

The two areas supplied by Eskom and Drakenstein Municipality will be discussed separately:

**1.1 The rural areas outside Stellenbosch town and Franschhoek are supplied with electricity by Eskom and include the smaller towns of Klapmuts, Jamestown, Raithby, Koelenhof, Wemmershoek, La Motte and Kylemore.**

Just about every municipality in the country are encountering similar challenges with Eskom supplying electricity to a portion of the municipal area. SALGA was subsequently requested to investigate the matter. The outcome of the investigation was that it is not feasible for the municipality to take over the Eskom supply areas. It was therefore proposed that municipalities rather enter into an agreement with Eskom to supply electricity on behalf (under control) of the municipality in these areas. The municipality can then negotiate the following benefits amongst others:

- Influence the standard of service delivery;
- Impose a levy on the tariffs to create an income and at the same time equalising the tariffs; and
- Make use of supply of electricity to control debt.

The latest information is that SALGA is negotiating the matter with Eskom at high level. This leaves municipalities in a situation where they have to wait for the outcome of the negotiations.

It should be noted that such an agreement will have to be preceded by a Section 78 investigation.

**3.2 The areas within Stellenbosch municipality where Drakenstein Municipality is supplying electricity are Pniel, Johannesdal and the rural area to the east of Pniel.**

This situation arose as a result of Drakenstein Municipality's supply area that developed into the rural area before Eskom's existence.

Taking over the supply of electricity in Pniel and Johannesdal will need amongst others the following actions:

- Determine the feasibility;
- Negotiations with Drakenstein Municipality; and
- Involve NERSA who is controlling the electricity supply area licenses.

It should be noted that the whole area have to be considered and not only Pniel. This will increase cost and complicate the matter even more. It will however be difficult to motivate otherwise. There is no detail available about previous investigations regarding this matter although it is clear what the outcome was.

Stellenbosch Municipality will have to take a supply from the Eskom substation in Kylemore and distribute to the concerned area. There are about 4 or 5 lines from Drakenstein crossing over into the Stellenbosch area. These lines will have to be cut on the border and connected to the Stellenbosch supply. The cost can be in the region of R7-8 million. On top

of this there will be operational and maintenance costs which will include extra personnel and equipment. The department is planning to conduct a study in order to provide more clarity on the matter. Such study can take up to six (6) months at approximately R200 000.

The possibility should also be considered of the impact if the Boschendal surrounding areas are developed in future. This brings a new dimension to the discussion. Such a development can have the effect that it will not be viable to take a supply from Eskom's Kylemore substation, but that Stellenbosch will have to construct a new 66/11 kV substation near the development. The cost can be in excess of R50 million of which the developer will have to make a pro rata contribution. The possibility of such a development being allowed to proceed, and potential timeframes, can influence a possible way forward on the issue.

#### 4. LEGAL IMPLICATION

**The Constitution** provide municipalities with the authority to administer and govern electricity reticulation as well as the right of National and Provincial Government to oversee and regulate effective performance by the municipalities.

*Sections 156 (1) and (2) assign municipalities executive authority and right to administer local government functions laid out in Schedule 4 Part B which includes electricity reticulation*

*Section 151(3) vests municipalities with the right to govern those matters on their own initiative, subject to national and provincial legislation, as provided for in the Constitution*

*Section 139(1): When a municipality cannot or does not fulfil an executive obligation in terms of legislation, the relevant provincial executive may intervene by taking any appropriate steps to ensure fulfilment of that obligation ...*

*Section 155(7) National government.... and provincial government have the legislative and executive authority to see to the effective performance by municipalities of their functions in respect of matters listed in Schedules 4 and 5, by regulating the exercise by municipalities of their executive authority*

The **Municipal Systems Act** (2000) defines how a municipality should provide municipal services to residents within its area of jurisdiction. In terms of the Act municipalities can engage or contract external parties such as utilities, agencies and corporations to provide services on their behalf. Aforementioned can only be done through a Service Delivery Agreement between the municipality and a service provider.

**Section 78** of the Municipal Systems Act outlines criteria and a process for deciding on institutional mechanisms to provide municipal services. In terms of the item, it appears as if **this process has not been followed** and most municipalities inherited Eskom as a distributor and that NERSA

issues a distributor license to Eskom in a given area without a Municipal Council resolution.

Section 78 decision regarding Service Delivery Mechanisms in the municipal area or entering into a Service Delivery Agreement with the municipality. This implies that NERSA seizes the powers of municipal councils of taking Section 78 decisions and disregards the Systems Act criteria and process.

**Electricity Regulation Act 28 of 2007** defines electricity reticulation as the “trading or distribution of electricity and includes services associate therewith”. Empowers the Minister or regulator to establish norms and standards, KPIs and for municipalities to ringfence their EDI financial statements

**The Municipal Fiscal Powers and Functions Act 12 of 2007** defines a “**municipal surcharge**” as a charge in excess of the municipal base tariff that a municipality may impose on fees for a municipal service provided by or on behalf of a municipality.

Section 76 of the *Systems Act* states that a municipality may provide a municipal service in its area or a part of its area through

An internal mechanism, which may be-

- (i) A department or other administrative unit within its administration;
- (ii) Any business unit devised by the municipality, provided it operates within the municipality's administration and under the control of the council in accordance with operational and performance criteria determined by the council; or

An external mechanism by entering into a **Service Delivery Agreement** with-

- (i) A municipal entity;
- (ii) Another municipality;
- (iii) An organ of state, including
- (bb) A **licensed service provider** registered or recognized in terms of national legislation; and
- (iv) A community based organisation or other non-governmental organisation legally competent to enter into such an agreement, or
- (v) Any other institution, entity or person legally competent to operate a business activity

In terms of the relevant Constitutional provisions and the subordinate legislation mentioned above, Service delivery agreement must be entered into between the parties. Aformentioned is however subject to the outcome of the negotiations between SALGA and ESKOM as mentioned in the item.

Item is supported.

## 5. FINANCIAL IMPLICATION

Finance supports the item

## 6. CONCLUSION

It will be advisable to wait for the outcome of the negotiations between Eskom and SALGA, but a preliminary investigation should be conducted into the possibility of taking over the electricity supply from Drakenstein Municipality.

**RECOMMENDED**

- (a) that a preliminary investigation be conducted by the Directorate: Engineering Services (Electrical Services) into the possibility and feasibility of taking over the electricity supply from Drakenstein Municipality; and
- (b) that billing cooperation be implemented between Drakenstein and Stellenbosch Municipality to implement more effective debt collection.

**(DIRECTOR: ENGINEERING SERVICES  
TO ACTION)**

**ENGINEERING SERVICES AND HUMAN SETTLEMENTS COMMITTEE  
MEETING: 2014-11-05: ITEM 6.1.3**

**RECOMMENDED**

- (a) that a preliminary investigation be conducted by the Directorate: Engineering Services (Electrical Services) into the possibility and feasibility of taking over the electricity supply from Drakenstein Municipality;
- (b) that billing cooperation be implemented between Drakenstein and Stellenbosch Municipality to implement more effective debt collection; and
- (c) that SALGA be requested to expedite this process through political intervention.

**(DIRECTOR: ENGINEERING SERVICES  
TO ACTION)**

**MAYORAL COMMITTEE MEETING: 2014-11-19: ITEM 5.1.5**

**RECOMMENDED BY THE EXECUTIVE MAYOR**

- (a) that a preliminary investigation be conducted by the Directorate: Engineering Services (Electrical Services) into the possibility and feasibility of taking over the electricity supply from Drakenstein Municipality;
- (b) that billing cooperation be implemented between Drakenstein and Stellenbosch Municipality to implement more effective debt collection; and
- (c) that SALGA be requested to expedite this process through political intervention.

**(DIRECTOR: ENGINEERING SERVICES  
TO ACTION)**



**25<sup>TH</sup> COUNCIL MEETING: 2014-11-26: ITEM 7.5**

**RESOLVED** (nem con)

- (a) that a preliminary investigation be conducted by the Directorate: Engineering Services (Electrical Services) into the possibility and feasibility of taking over the electricity supply from Drakenstein Municipality;
- (b) that billing cooperation be implemented between Drakenstein and Stellenbosch Municipality to implement more effective debt collection; and
- (c) that SALGA be requested to expedite the Eskom process through political intervention.

**(DIRECTOR: ENGINEERING SERVICES TO ACTION)**

# APPENDIX 2

**7.14 TAKE-OVER OF PNIEL AND HOLLANDSE MOLEN ELECTRICAL DISTRIBUTION AREAS BY STELLENBOSCH MUNICIPALITY**  
**OORNAME VAN DIE PNIEL EN HOLLANDSE MOLEN ELEKTRISITEITS DISTRIBUSIE AREAS DEUR STELLENBOSCH MUNISIPALITEIT**  
**UKUTHATHWA KOBONELELO LOMBANE E PINIEL NE HOLLANDSE MOLEN NGUMASIPALA WASE STELLENBOSCH**

**UNANIMOUSLY RESOLVED**

1. that the transfer of the Pniel and Hollandse Molen electricity network to Stellenbosch Municipality, be approved in principle;
2. that the negotiated charges for the transfer of existing electrical infrastructure, services and metering to Stellenbosch at the current depreciated value be approved in principle;
3. that it be approved that Drakenstein intends to resell Stellenbosch bulk electricity at the Eskom Megaflex tariff, but that legal implications in this regard to be investigated;
4. that the financial implications as set out be noted;
5. that the legal implications be noted; and
6. that all the required network changes, upgrades, new metering points and switchgear be installed by Drakenstein to prepare the networks for take-over, be at cost to Stellenbosch Municipality.

Meeting: Council -29/09/2015 Ref No: 16/2/1 Call No: 950061		Submitted by Directorate: Infrastructure Services Author/s: Willie Albertyn Referred from: EMBMC 23/09/2015	
<u>PAS:</u>	<u>ACTION:</u>	<u>RESPONSIBLE DEPT:</u>	<u>DUE DATE:</u>
	Implement decision	EM: Infrastructure Services (WA)	

# APPENDIX 3

MINUTES; COUNCIL/RAAD/IBHUNGA  
20 MAY 2016

7.9	TRANSFER OF THE OLD SIMONDIUM CLINIC SITUATED ON PORTION 2 OF FARM 936 PAARL DIVISION FROM CAPE WINELANDS DISTRICT MUNICIPALITY TO DRAKENSTEIN MUNICIPALITY
	OORDRA VAN VOORMALIGE KLINIEKGEBOU TE SIMONDIUM VANAF KAAPSE WYNLAND DISTRIKSMUNISIPALITEIT NA DRAKENSTEIN
	UKUTSHISHELWA KWE KLINIKI YE SE OLD SIMONDIUM EKWICEBA 2 KEFAMA NO 936 E PAARL ISUKA KU MASIPALA WESITHILI WASE CAPE WINELANDS ISIWA KUMASIPALA WESE DRAKENSTEIN

UNANIMOUSLY RESOLVED

- 1 that Council consents to the gratis acquisition of Portion 2 of Farm 936 Paarl Division, subject thereto that the Cape Winelands Municipality ensures that the property is only occupied by the legal tenant and no other persons and that the property is not being used for residential purposes;
- 2 that the CWDM be responsible for all costs relating to the transfer of the subject property, including the conveyancing fees;
- 3 that the municipal technical departments investigate the future development potential and/or constraints of the subject property in relation to the facility infrastructure needs of the community in the Simondium area;
- 4 that MAYCO decide on the most appropriate use of the property; and
- 5 that upon registration of transfer, the asset be captured in the Asset Register and arrangements for insurance be made.

Meeting: Council - 18/05/2016	Submitted by Directorate: Corporate Services
Ref No: 15/M/1 (F936/2) P	Authorise: N October
Call No: 1098574	Referred from: EIS&MC 11/05/2016
<u>PAR:</u>	<u>ACTION:</u> Implement decision
	<u>RESPONSIBLE DEPT:</u> Manager: Properties
	<u>DUE DATE:</u>

7.10 TAKE-OVER OF PNIEL AND HOLLANDSE MOLLEN ELECTRICAL DISTRIBUTION AREAS BY STELLENBOSCH MUNICIPALITY
GORNAME VAN PNIEL EN HOLLANDSE MOLLEN ELEKTRIESE DISTRIBUSIE AREAS DEUR STELLENBOSCH MUNISIPALITEIT
UKUTHATHWA KOKUHANJISWA KOMBANE KWIMIMANDLA YASE PNIEL KUNYE HOLLANSE MOLLEN MGUMASIPALA WASE STELLENBOSCH

UNANIMOUSLY RESOLVED

- 1 that the ceding of the Pniel and Hollandse Mollen electricity networks to Stellenbosch Municipality, be approved in principle
- 2 that the negotiations for transfer of existing electrical infrastructure, services and metering be approved in principle and charged to Stellenbosch Municipality, at an estimated asset carrying value of R9 059 664-14 (as at 30 June 2015).

**MINUTES: COUNCIL/RAAD/IBHUNGA**  
**20 MAY 2015**

1. that it be noted that Drakenstein intends to sell to Stellenbosch bulk electricity at the Eskom Magalix tariff plus a percentage value between 5 and 10% but legal implications in this regard must be investigated in consultation with NERSA;
2. that the financial implications as set out, **be noted**;
3. that the legal implications, **be noted**, and
4. that the required network, upgrades, new metering points and switchgear be installed at cost to Stellenbosch Municipality.

Meeting Ref No: 15/211	Council Ref No: 18/05/2015	Submitted by Directorate: Author's: Referred from:	Infrastructure Services Winné Abertyn EM&MC 11/05/2015
<u>PAR:</u>	<u>ACTION:</u> Implement decision	<u>RESPONSIBLE DEPT:</u> Executive Manager Infrastructure Services	<u>DUE DATE:</u>

**8. MATTERS FOR CONSIDERATION/INFORMATION**  
**SAKE VIR OORWEGING/INLIGTING**  
**IMIBA YOKUQWALASELWA/YOKWAZISA**

- 8.1 TENDER CG 1/2015: OFFICE ALTERATIONS AT PAARL CIVIC CENTRE- VARIATION OF CONTRACT AMOUNT**  
**TENDER CG 1/2015: KANTOORVERANDERINGE BY DIE PAARL BURGERSENTRUM- VARIASIE VAN KONTRAKBEDRAG**  
**ITHENDA CG 1/2015: UKUGUQULWA KWE OFISI KWIZIKHO LOLUNTU E PAARL - UKUTSHINTSWA KWEXABISO LE SIVUMELWANO**

**UNANIMOUSLY RESOLVED**

1. that the reasons for the variation of the above contract amount, **be noted**, and
2. that the variation of the contract amount for Tender CG 1/2015 from R4 600 444.00 to R6 877 66.12 which equates to a variation of 46.6% of the original contract value, be condoned and approved in terms of Section 116(3) of the Municipal Finance Management Act, 56 of 2003.

Meeting Ref No: 11/1515	Council Ref No: 18/05/2015	Submitted by Directorate: Author's: Referred from:	Corporate Services H Marais
<u>PAR:</u>	<u>ACTION:</u> TAKE NOTE	<u>RESPONSIBLE DEPT:</u> Supply Chain Management Manager	<u>DUE DATE:</u>

# APPENDIX 4

DIRECTORATE : INFRASTRUCTURE SERVICES  
DEPARTMENT : ELCTRO TECHNICAL ENGINEERING  
TELEPHONE : 021-807 4684

Enquiries: L Laing  
Reference: 8/2/5

26 May 2016

Mr. J. Coetzee  
Stellenbosch Municipality  
PO Box 17  
**STELLENBOSCH**  
7600

**Attention: Mr. J. Coetzee**

Dear Sir / Madam

**TAKE-OVER OF PNIEL AND HOLLANDSCHE MOLEN ELECTRICAL DISTRIBUTION AREAS BY STELLENBOSCH MUNICIPALITY**

Herewith a quotation for taking ownership of the existing assets of Drakenstein Municipality as well as two new high tension bulk supplies.

1MVA H/T bulk supply (Hollansche Molen, erf 1655)	R	414 784.00
4MVA H/T bulk supply (Pniel - Riversmeet, erf 905)	R	585 216.00
Take-over of Drakenstein Munisipality assets	R	9 059 664.16
14% V.A.T.	R	1 408 352.98
Consumer deposit (R 400.00/KVA)	R	2 000 000.00
<b>Total</b>	<b>R</b>	<b>13 468 017.14</b>

All figures depicted in this estimate are as per council resolution, reference Collaborator number 1096515. After the two new bulk connections have been supplied, all assets after each high tension metering panel will be seen as Stellenbosch Municipality's assets.

Please contact Me. V Ontong (021 807 4519) at Financial Services for information to make the payments.

**Office hours – (08:00 – 12:45 and 13:45- 17:00, Fridays – 15:45)**



**W ALBERTYN**  
**DEPUTY EXECUTIVE MANAGER: ELECTRO TECHNICAL ENGINEERING**

I:\Beplanning3\Ebers\Eber-2016\Eber269

ADDRESS ALL CORRESPONDENCE TO  
THE MUNICIPAL MANAGER  
BERGRIVER BOULEVARD-  
P O BOX 1, MAIN STREET, PAARL, 7622  
Telephone: +27 (21) 807 4500 Fax: +27 (21) 872 8054  
ceo@drakenstein.gov.za

RIG ALLE KORRESPONDENSIE AAN  
DIE MUNISIPALE BESTUURDER  
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**8.5 INVESTIGATION WHY THE ADMINISTRATION OBTAINED A COURT ORDER FOR THE SALE OF EXECUTION OF ERF 3291, 17 LUCKHOFF STREET, IDAS VALLEY, STELLENBOSCH**

*File number* : 8/1/Financial  
*Report by* : Chief Financial Officer  
*Compiled by* : Chief Financial Officer  
*Delegated authority* : Council

**Strategic intent of item:**

Preferred investment destination	<input checked="" type="checkbox"/>
Greenest municipality	<input type="checkbox"/>
Safest valley	<input type="checkbox"/>
Dignified Living	<input type="checkbox"/>
Good Governance	<input checked="" type="checkbox"/>

**1. PURPOSE OF REPORT**

To provide a report to Council with regards to the Motion of Exigency received by Councillor Hendrickse at the Council meeting of 24 February 2016.

**2. DISCUSSION**

A comprehensive Debt Management report was submitted to the Finance Portfolio Committee meeting of 8 March 2016, after the motion was received from Councillor Hendrickse. (Attached as **APPENDIX 1**)

The report stipulates that no court order for a sale of execution for Erf 3291 was obtained nor requested.

Default Judgment was granted against the debtor pursuant to the Summons which was not defended. The municipality accordingly proceeded with the issuing of a Warrant of Execution.

The processes, which are followed by the Credit Control and Debt Collection Section, was clearly set out in the report of 8 March 2016 and that the Municipality will not proceed with any Sale in Execution without prior approval from Council.

**RECOMMENDED**

that Council take note of the report as submitted to the Finance Portfolio Committee.

**(CHIEF FINANCIAL OFFICER TO ACTION)**

# APPENDIX 1

**MINUTES FINANCE AND STRATEGIC AND CORPORATE SERVICES 2016-03-08  
COMMITTEE MEETING**

**Chairperson: Councillor, N Jindela]  
[Portfolio: Financial Services]**

**6.2.4 DEBTOR MANAGEMENT**

*File number* : 8/1/Financial  
*Report by* : Chief Financial Officer  
*Compiled by* : Chief Financial Officer  
*Delegated authority* : Finance & Strategic Standing Committee

**Strategic intent of item:**

Preferred investment destination	<input checked="" type="checkbox"/>
Greenest municipality	<input type="checkbox"/>
Safest valley	<input type="checkbox"/>
Dignified Living	<input type="checkbox"/>
Good Governance	<input checked="" type="checkbox"/>

**1. PURPOSE OF REPORT**

To provide comment on debtor management and to provide information regarding the current processes which are followed by the Credit Control and Debt Collection Section, and more specifically the processes after a final demand has been issued, still without any response from the debtor for notification.

**2. DISCUSSION**

With reference to the SCA letter (Motion of Exigency) dated 20 February 2016 by Clr Hendrickse, "...why the administration has gone to the extreme action to obtain a court order for the sale of execution of the property Erf 3291..."

It must be put on record that no court order for a sale of execution for Erf 3291 was obtained nor requested.

Default Judgment was granted against the debtor pursuant to the Summons which was not defended. We accordingly proceeded with the issuing of a Warrant of Execution.

Please refer to the information below regarding the current processes which are followed by the Credit Control and Debt Collection Section, and more specifically the processes after a final demand has been issued, still without any response from the debtor.

Chairperson: Councillor, N Jindela]  
 [Portfolio: Financial Services]

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### 3. BACKGROUND

With reference to Council's Credit Control and Debt Collection Policy, the following communication steps and control measures are in place to liaise with the debtor regarding any outstanding account:

1. Notes on accounts to explain the steps Council will follow whether a debtor is in default
2. First Notices via post and/or e-mail and/or cell phone text messages (SMS) to inform debtor of any outstanding debt directly after the due date. Please note, notices are sent each month notwithstanding the fact that accounts are in arrears for more than one month.
3. Notices of Council's intention to follow the steps for disconnection or restriction of services, 14 days after first notices have been issued
4. Notices of informing the debtor of actual Disconnection or restriction, (one to two days before the action for disconnection/restriction)
5. Final Demands or Notices send quarterly to request payment within 14 days from date of final demands/notices and to avoid legal action
6. Should the debtor's account still be in arrears after the 14 days period, the necessary legal steps will be followed to recover the outstanding debt
7. The Debtor's account will be handed over to the legal team in the Credit Control and Debt Collection Section who will execute the following steps :

#### *7.1 Section 129 Letter of Demand*

A Section 129 Letter of Demand will be issued via registered mail and the debtor has 14 days to reply;

#### *7.2 Summons:*

If no reply or no payment has been received by the Municipality within the prescribed time period, a Simple Summons will be issued.

A debtor has 10 days from date of the service of Summons to, either file Notice of Intention to Defend, pay the amount as set out in the Summons, or make any arrangement to settle the account

*If debtor filed a Notice of Intention to Defend, the following steps will follow:*

1. The Municipality has to serve a Declaration on the Debtor within 20 working days from date of service of Notice of Intention to Defend;

MINUTES      FINANCE AND STRATEGIC AND CORPORATE SERVICES      2016-03-08  
COMMITTEE MEETING

Chairperson: Councillor, N Jindela]  
[Portfolio: Financial Services]

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2. The Debtor has to serve a Plea on the Municipality within 20 working days from date of service of Declaration;
3. If debtor is not to serve a Plea within 20 days, the Municipality has to serve a Notice of Bar;
4. The Debtor then has 5 days to serve a Plea;
5. If no Plea has been filed within the five days, the Municipality will proceed with Default Judgment
6. If debtor neither pays the amount claimed nor serves Notice of Intention to Defend, the Municipality may also proceed with Default Judgement.

#### *7.3 Default Judgement*

1. The Municipality will now proceed with the issuing of a Request for Default Judgment together with a Warrant of Execution;
2. If the Default Judgment and Warrant of Execution is granted by court, the sheriff is instructed to serve Default Judgment together with Warrant of Execution on Debtor;
3. The Sheriff is to return with either an Inventory of all executable goods attached or with a Nula Bona return;
4. The Municipality is then to decide whether to proceed with the Sale of Execution of movable goods attached, to hold a Section 65 Financial Enquiry or to proceed with Sale of Execution of immovable property;
5. If Default Judgment is granted by the Court, the Judgment Debt will be secured for 30 years.

**It is important to emphasise that the Municipality will not proceed with any Sale in Execution for movable goods or immovable property, without prior approval from Council.**

The legal team has since July 2014 issued 1997 Section 129 letters, 1142 summonses and 290 Request for Default Judgments. A total of 215 arrangements have been concluded while an amount of more than Ten Million Rand has been recovered.

A risk that remains with debt management relates specifically to the quality of water consumption which is not affordable for the consumer. To mitigate this risk the Municipality commenced with the installation of Water Management Devices. The Water Management Device limits the daily water available and therefore protects the consumer from escalating debt. These devices will be installed through a pilot project; pipe replacement program as well as the new subsidy housing projects.



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**8.6 CONSIDERATION OF IRREGULAR EXPENDITURE DISCLOSED IN THE ANNUAL FINANCIAL STATEMENTS OF 2014/2015 FOR WERNER ZYBRANDT**

*File number* : 3/3/3/6/7  
*Report by* : Chief Financial Officer  
*Compiled by* : Head: Supply Chain Management  
*Delegated Authority* : Council

**Strategic intent of item**

Preferred investment destination	
Greenest municipality	
Safest valley	
Dignified Living	
Good Governance	X

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**1. PURPOSE OF THE REPORT**

To provide information regarding “irregular expenditure” for oversight by MPAC. Council needs to consider and approve that the expenditure is deemed irrecoverable and be written off in terms of the MFMA Section 32 (2).

**2. BACKGROUND**

The Committee was established to deal with expenditure not aligned or non-compliant with Council’s approved policies and the Municipal Finance Management Act, herein after referred to as the “Act” and “Policies”.

**2.1 Legislation**

The Act (Section 32) stipulates the following with regard to unauthorized, irregular or fruitless and wasteful expenditure:

“(1) without limiting liability in terms of the common law or other legislation-

- (a) *a political office-bearer of a municipality is liable for unauthorized expenditure if that office-bearer knowingly or after having been advised by the accounting officer of the municipality that the expenditure is likely to result in unauthorized expenditure, instructed an official of the municipality to incur the expenditure;*
- (b) *The accounting officer is liable for unauthorized expenditure deliberately or negligently incurred by the accounting officer, subject to subsection (3);*
- (c) *Any political office-bearer or official of a municipality who*

*deliberately or negligently committed, made or authorized an irregular expenditure, is liable for that expenditure; or*

- (d) *Any political office-bearer or official of a municipality who deliberately or negligently made or authorized a fruitless and wasteful expenditure is liable for that expenditure”.*

In terms of Section 32 (2)

*“A municipality must recover unauthorized, irregular or fruitless and wasteful expenditure from the person liable for that expenditure unless the expenditure-*

- (a) *In the case of unauthorized expenditure, is-*
- (i) *authorized in an adjustments budget; or*
  - (ii) *Certified by the municipal council, after investigation by a council committee, as irrecoverable and written off by the council; and*
- (b) *In the case of irregular or fruitless and wasteful expenditure, is, after investigation by a council committee, certified by the council as irrecoverable and written off by the council”.*

A further stipulation, Section 32(4) compels the accounting officer to

*“Promptly inform the mayor, the MEC for local government in the province and the Auditor-General, in writing, of-*

- (a) *Any unauthorized, irregular or fruitless and wasteful expenditure incurred by the municipality;*
- (b) *Whether any person is responsible or under investigation for such unauthorized, irregular or fruitless and wasteful expenditure; and*
- (c) *The steps that have been taken-*
  - (i) *To recover or rectify such expenditure; and*
  - (ii) *To prevent a recurrence of such expenditure”.*

Irregular expenditure as defined under Chapter 1 of the Act:

- d) *Expenditure incurred by a municipality in contravention of, or that is not in accordance with, a requirement of this Act, and which has not been condoned in terms of section 170;*
- e) *Expenditure incurred by a municipality in contravention of, or that is not in accordance with, a requirement of the Municipal systems Act, and which has not been condoned on terms of that Act;*
- d) *Expenditure incurred by a municipality in contravention of, or that is not in accordance with, a requirement of the supply chain management policy of the municipality or any of the municipality’s by-laws giving effect to such policy, and which has not been condoned in terms of such policy or by-law”.*



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### 3. DISCUSSION

Management disagreed with the audit finding based on the following:

DSM07/15 was handled as a deviation as per SCM Regulation 36 which allows: “the Accounting Officer to dispense with the official procurement processes established by the policy and to procure any required goods or services through any convenient process.”

It is not necessary for a deviation to obtain three different quotes or whose names appear on the list of accredited prospective service providers as per SCM regulation 17 (a). Deviation is reported monthly to CFO, Accounting Officer and Council and it's not necessary to adhere to SCM

Regulation 17 (Deviation was approved based on the following classification (v) “in any other exceptional case where it is impractical or impossible to follow the official procurement processes”.

The request to deviate was based upon the discussion which alluded to the following:

- Current System of Delegations (SOD) and policies did not comply with all legislative requirements and refers to some Ordinances/Acts that was either repealed or amended
- Various versions of (SOD ) were in circulation causing confusion
- Policies are not incorporated in the document

The above made it critical that the System of Delegations be updated immediately as the out-dated document created more risk and shortfalls whereby officials could authorise requests which didn't fall in their statutory requirement. Impending SPLUMA for Planning were also critical to implement as quick as possible.

An FQ process could easily consume at least 3 weeks in terms of compiling the specifications; advertising; compiling the technical evaluation and then approval of the FQ.

As it turned out the work done was way in excess what was quoted for. In fact probably double which would have taken the scope of works into a bidding procurement process which would have taken longer than 3 months which could be ill afforded.

Two other experts were also approach, but were not available or more expensive.

The actual work at the end entailed about 20 workshops with various stakeholders by a technical expert and a leader in the field of municipal governance. These workshops included at least 2 sessions per directorate plus 3 sessions with the political leadership including 3 sessions with the (Mayor and Speaker); Mayco and also the Council to promote the required Council approval of the delegations.

The Municipality obtained excellent value for money given the time spent by an expert workshoping the delegations with various parties including various political engagements to promote Council approval all in an effort

to address critical service delivery governance shortcomings and impending new legislation implementation like SPLUMA successfully which have put the Municipality at great risk.

Deviations don't need comparison quotes to evaluate based on the SCM regulation: "the Accounting Officer to dispense with the official procurement processes established by the policy and to procure any required goods or services through any convenient process."

This initial discovery of SOD shortfalls is in relation to historic inadequacies/shortfalls and needed to be corrected sooner than later.

#### 4. FINANCIAL IMPLICATIONS

The overall financial implications as follow:

1. <u>Werner Zybrandts</u>	<u>R 120 000.00</u>
----------------------------	---------------------

#### 5. CONCLUSION

Value was obtained through this appointment.

#### 6. COMMENTS FROM OTHER DIRECTORATES

##### 6.1 COMMENTS FROM DIRECTORATE: STRATEGIC & CORPORATE SERVICES (Director)

National Treasury Circular 68 states the following:

*"In terms of section 32(2)(b) irregular expenditure may only be written-off by Council if, after an investigation by a council committee, the irregular expenditure is certified as irrecoverable.*

*"All instances of irregular expenditure must be recovered from the liable official or political office-bearer, unless the expenditure is certified by the municipal council, after investigation by a council committee, as irrecoverable and is written off by the council. In other words, the expenditure that is written off is therefore condoned."(page 10).*

The relevant parts of Section 32 further states:

*"A municipality must recover unauthorized, irregular or fruitless and wasteful expenditure from the person liable for that expenditure unless the expenditure-*

*(a) ...; and*

*(b) In the case of irregular or fruitless and wasteful expenditure, is, after investigation by a council committee, certified by the council as irrecoverable and written off by the council".*

The circular further states that write off may only take place if the irregular expenditure is certified by Council as irrecoverable, based on the findings of an investigation.

**Investigation of Irregular Expenditure**

Section 32(4) requires that the municipal manager must report to Council and the MEC whether any person is responsible or under investigation for the, irregular expenditure.

In the current matter the AGSA investigated the matter and compiled a full report as per their "Communications of Audit Findings" as part of their regulatory audit and further investigation of this particular matter is therefore not needed. I am respectfully of the view that their investigation was complete and can be tabled in its current form to a council committee for its recommendation to council.

**Recover or rectify such expenditure**

*In the current matter the system of delegations was approved by council. Council therefore did receive the goods and services they contracted for. Council can therefore not recover the expenditure as the goods was received and approved by council.*

*Council will rectify the expenditure if condone by council.*

**Prevent a recurrence of such expenditure:**

The administration has since the finding taken specific steps to minimise deviations in general. The current deviation report is clear evidence that very specific steps are taken to prevent a possible recurrence of any irregular expenditure.

**RECOMMENDED**

that Council certifies the expenditure to the amount of R120 000.00 as irrecoverable and that it is written off.

**(CHIEF FINANCIAL OFFICER TO ACTION)**

**8.7 UNAUTHORISED EXPENDITURE AS DISCLOSED IN NOTE 53 OF THE AUDITED 2014/2015 ANNUAL FINANCIAL STATEMENTS**

*File No* : 8/1/AFS  
*Report By* : Financial Services  
*Compiled By* : Manager: Budget Office  
*Delegated Authority* : Council

**Strategic intent of item**

Preferred investment destination	<input type="checkbox"/>
Greenest municipality	<input type="checkbox"/>
Safest valley	<input type="checkbox"/>
Dignified Living	<input type="checkbox"/>
Good Governance	<input checked="" type="checkbox"/>

**1. PURPOSE OF REPORT**

To submit to the Council a report on the unauthorised expenditure as disclosed in Note 53 of the audited 2014/2015 Annual Financial Statements that cannot be authorised by Council through another adjustments budget for the 2014/2015 financial year but needs to be certified by Council as irrecoverable unauthorised expenditure and to be written off.

**2. BACKGROUND**

Section 32(1)(a) of the Municipal Finance Management Act (MFMA) determines that a political office-bearer of a municipality is liable for unauthorised expenditure if that office-bearer knowingly or having been advised by the accounting officer of the municipality that the expenditure is likely to result in unauthorised expenditure, instructed an official of the municipality to incur the expenditure.

Section 32(1)(b) of the MFMA also determines that the accounting officer is liable for unauthorised expenditure deliberately or negligently incurred by the accounting officer.

Section 32(2)(a) of the MFMA further determines that a municipality must recover unauthorised expenditure from the person liable for that unauthorised expenditure unless the expenditure in the case of unauthorised expenditure is authorised in an adjustments budget (which cannot take place anymore); or, after investigation by a committee of council, is certified by the council as irrecoverable and to be written-off.

**3. DISCUSSION**

Section 1 of the Municipal finance Management Act (MFMA) defines that-

**“”unauthorised expenditure”**, in relation to a municipality, means any expenditure incurred by a municipality otherwise than in accordance with section 15 or 11(3), and includes-

- (a) *overspending of the total amount appropriated in the municipality’s approved budget [which is not the case]*
- (b) *overspending of the total amount appropriated for a vote in the approved budget [which is the case]*
- (c) *expenditure from a vote unrelated to the department or functional area covered by the vote [which is not the case];*
- (d) *expenditure of money appropriated for specific purpose, otherwise than for that specific purpose [which is not the case]*
- (e) *spending of an allocation referred to in paragraph (b), (c) or (d) of the definition of “allocation” otherwise than in accordance with any conditions of allocations [which is not the case]; or*
- (f) *a grant by the municipality otherwise than in accordance with this Act [which is not the case].”*

Unauthorised expenditure was disclosed as legislatively required in the financial statements and due to prior period corrections, the comparatives (2013/2014) and opening balances (2012/2013) were affected and updated accordingly. This resulted in unauthorised expenditure being disclosed for the following Vote/Directorate:

- **Engineering Services**  
Overspending on non-cash items namely Depreciation and Contributions to Provisions contributed to the overspending per vote for the year 2014/2015 and 2013/2014 financial year.
- **Community and Protection Services**  
The overspending for 2013/2014 is due to the implementation of iGRAP 1 and the impact on the accounting treatment of non-cash revenue and expenditure (Traffic Fines and Bad Debt Provision).

**4. Financial Implications****Unauthorised expenditure per Vote/Directorate**

Unauthorised expenditure	2014/2015	2013/2014
Civil Engineering Services	49,806,155	32,294,361
Community and Protection Services		25,898,883
	49,806,155	58,193,244

**5. Legal Input (provided by the Director Strategic Support Services)**

In addition to the definition of unauthorised expenditure and S32 of the Local Government: Municipal Finance Management Act 56 of 2003 set out above, National Treasury Circular 68 provide further guidance on how council should deal with *inter alia* unauthorised expenditure. Circular 68 provide *inter alia* that when Council consider unauthorised expenditure it must consider:

*“Are there good grounds shown as to why an unauthorised expenditure should be authorised? For example:*

- the mayor, accounting officer or official was acting in the best interests of the municipality and the local community by making and permitting unauthorised expenditure;*
- the mayor, accounting officer or official was acting in good faith when making and permitting unauthorised expenditure; and*
- the municipality has not suffered any material loss as a result of the action.*

*In these instances, the council may authorise the unauthorised expenditure. If unauthorised expenditure is approved by council, there would be no further consequences for the political office-bearers or officials involved in the decision to incur the expenditure.”*

The unauthorised expenditure relates to non-cash items and the above cited paragraph would clearly apply.

The recommendation is therefore supported.

**RECOMMENDED**

- (a) that Council certify the unauthorised expenditure amount per Vote (Directorate) of R 49 806 155 (2014/2015) and R 58 193 244 (2013/2014) as set out above as irrecoverable and to be written off; and
- (b) that Council accept the reasons in the report and record that no political office-bearer or official of the Municipality deliberately or negligently incurred the over-expenditure and unauthorised expenditure to be written-off as irrecoverable.

**(CHIEF FINANCIAL OFFICER TO ACTION)**

**8.8 PROPOSAL FOR THE REVIEW OF THE TARIFF STRUCTURE IN RESPECT OF PUBLIC RENTAL UNITS***File number* : 5/17/16*Report by* : Manager: Housing Administration*Compiled by* : Director: Human Settlements and Property Management*Delegated Authority* : Council**Strategic intent of item**

Preferred investment destination

Greenest municipality Safest valley Dignified Living Good Governance **1. PURPOSE OF REPORT**

To submit to Council a simplified and affordable revised tariff structure that will apply to all municipal public rental housing units following Council's approved strategy for the management of its public rental stock for Indigent Households.

The current tariff structure is unaffordable for the majority of the tenants.

**2. BACKGROUND**

The Department administers the following public rental units:

LOCATION	NUMBER OF UNITS
<b>CLOETESVILLE (240 units)</b>	
Long and Kloof Streets	132
Rhode Street	72
Pine, Primrose, Jacaranda and Eike Street Maisonettes	36
<b>STELLENBOSCH (221 units)</b>	
Lavanda	72
Aurora	72
Phyllaria	77
<b>KAYAMANDI (144 units)</b>	
10 and 13 <sup>th</sup> Closes	146
<b>TOTAL</b>	<b>607</b>

For more than ten years the municipality has been struggling to address the challenges experienced at its rental stock. These include the following:-

- Negative Mind-sets reinforced by the general appearance of the flats;
- Anti-social behaviour/lack of tolerance/ disrespect/vandalism of property;
- Unlawful activities and substance abuse;
- Contravention of Lease Agreements, particularly, illegal occupation;
- Poverty and unemployment.

At its 20<sup>th</sup> meeting held on 25<sup>th</sup> June 2014, Council approved a strategy for the management of its public rental stock and the following is a brief summary of progress with the approved strategy:

- a) **Survey of all properties:** This has been concluded and an interim report of the findings served before the Portfolio Committee of December 2015. The Department plans to conclude all its interviews with alleged illegal occupants by the end of March 2016 and submit a final report to Council of its findings.

In addition, the department has created a database of its public rental properties that includes financial information as obtained from the relevant Finance Department;

- b) **Housing Consumer Education workshops:** These have since been held specifically for tenants of our rental units. Unfortunately, not all the workshops were well attended.
- c) **Maintenance of assets:** During the past few years the municipality has invested considerable funding in the upgrading of the various public rental units and the transformation is remarkable.
- d) **Grounds:** The department has initiated a pilot programme using EPWP workers to improve and maintain the condition of the grounds, staircases and walkways.
- e) **Decisive action against Transgressors:** To date the Department has referred 19 (nineteen) cases of Breach of Lease Agreement / illegal occupancy to Legal Services and attorneys have already been appointed to proceed with eviction for 7 of these cases. (These do not include illegal occupants identified as part of the recent surveys or former employees in staff rental housing).
- f) **Rentals and Repayment:** The resolution of Council requires that Housing Administration Department along with Finance Department explore ways to
- Enhance debt collection
  - Review tariff structure
  - Review the evaluation process used to identify persons who qualify for indigent assistance;
  - Improve consultation in matters relating to debt management and the writing off of debt.



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### 3. DISCUSSION

One of the key issues identified in the report to Council is the need to review the tariff structure. Tenants of public rental stock spend 19-22 years on the waiting list of the municipality before they are allocated accommodation. This is as a result of the extreme shortage of affordable accommodation in Stellenbosch.

A recent survey revealed that only 16 of the 240 Cloetesville tenants were under the age of 50 years (**93% of tenants are older than 50 years**). The dual effect of an ageing population and limited economic opportunities have a significant impact on our tenant's ability to afford the rentals.

**Currently ± 64% of the tenants of rental stock are registered as indigent.** The current rental structure is based on cost recovery. This is proving to be unaffordable for pensioners and other indigent households, resulting in debt having to be written off.

#### 3.1 CURRENT TARIFF STRUCTURE

The current tariffs in respect of rentals and services are comprised of the following:

**3.1.1 Rentals:** Tenants pay a standard amount for rental (based on the size of the unit occupied). This amount is separately charged.

**3.1.2 Water/Sewerage/Refuse removal:** In some cases no separate metering occurs for water. The amount with regard to services (excluding electricity) is standard, regardless of the size of the unit (and is based on the overall consumption of the past financial year). However these amount are separately charged as general services

**3.1.3 Fixed and Fluctuating Costs (FFC):** This includes amounts in respect of:

- Rates
- Insurance
- Cleaning of grounds and staircases
- Interest and redemption on loans;
- Community facilities
- Maintenance
- Bad Debt
- Caretaker's honorarium
- Electrification of general areas
- Water consumption for general areas

This component forms the bulk of the rental tariff, ranging from R 225.51 to R1 124.37 per month.

The proposed new rental structure simplifies matters and does away with the FFC which is at present attempting in vain to recuperate the actual costs associated with the buildings. By implication this also means that no property rates will be levied against municipal dwellings that are rented to members of the public. Should the proposed new

rental structure be approved, paragraph 7.6 of the rates Policy will be regarded as amended accordingly.

### 3.2 THE CURRENT RENTALS CHARGED FOR THE VARIOUS AREAS ARE AS FOLLOWS

#### 3.2.1 LAP FLATS (221 units)

	1 Bed room	2 Bedroom	3 Bedroom
TOTAL	R1 198.54	R1 325.27	R1 459.03

#### 3.2.2 CLOETESVILLE (240 units)

	Maisonettes (36 units)	Long+Kloof streets (132 units)	Rhode St (72 units)
TOTAL	R 732,65	R 838.26	R 907.36

#### 3.2.3 KAYAMANDI (144 one room units)

SIZE	TOTAL
29m <sup>2</sup>	R1 296.10
32m <sup>2</sup>	R1 430.18

### 3.3 THE CURRENT PAYMENT LEVELS

AREA	Units	2014/15 amounts raised	Total paid		2015/16 11 months amounts raised (rental only)	Total paid (rental only)	% payment level (rental only)
<b>CLOETESVILLE</b>							
Long and Kloof Streets	132	1,123,512	-141,002	12.55%	1,305,172	-256,774	19.67%
Rhode Street	72	766,127	-60,694	7.92%	736,445	-101,669	13.81%
Pine, Primrose, Jacaranda and Eike Street Maisonettes	36	255,193	-79,918	31.32%	172,312	-58,274	33.82%
<b>STELLENBOSCH</b>							
Stellenbosch-Lavanda, Aurora and Phyllaria	221	2,999,189	-610,585	20.36%	3,061,915	-782,466	25.55%
<b>KAYAMANDI</b>							
Kayamandi-10 and 13th Closes	144	1,953,867	-207,991	10.65%	1,960,603	-198,821	10.14%
<b>TOTAL</b>	<b>605</b>	<b>7,097,888</b>	<b>-1,100,190</b>	<b>16.56%</b>	<b>7,236,447</b>	<b>-1,398,004</b>	<b>19.32%</b>

The current payment levels are extremely low, mainly due of the unaffordable rentals. The table above excludes outstanding balances with regards to municipal services. The tendency is that, due to the high and unaffordable rentals, municipal services are not paid either.

### 3.4 FINANCIAL IMPLICATIONS

Should the new rentals as stipulated in paragraph 4 be implemented it would have an insignificant effect on the cash flow position of the municipality.

<b>Current Rentals</b>	
Annual Accrual - (Rent + FFC)	±R7.8million
Less Average Annual Payments received	±R1.5million
= Loss of cash (80.76%)	±R6.3million
<b>Proposed New Rental</b>	
Annual Accrual (estimated)	R1.4million
<b>Difference between current cash received and proposed new rentals (annually)</b>	<b>±100,000</b>

It is estimated that the actual loss in cash will amount to only approximately R100 000 per annum as opposed to the current loss that needs to be written off periodically.

Implementing the proposed new tariffs will have the following positive results:

- Positive reaction from the tenant community that will most likely lead to a much improved payment rate of more affordable rental.
- Improved payment rate of municipal services among tenants due to increased disposable income.
- Improved standard of living amongst tenants who are mostly indigent.
- More accurate reflection of municipal assets in the sense of debtors not being over stated.
- Reduced administrative burden as less credit control and debt collection processes would be required.
- Less need for electricity supply to be blocked.
- Reduced need to write off bad debts on a regular basis.

## 4. PROPOSED TARIFF STRUCTURE

### 4.1 Services (Water/Sewerage/Refuse Removal) will be based on consumption.

In cases where separate metering does not occur, the costs will be proportionate to the size of the dwelling in terms of number of bedrooms.

- 
- 4.2 It is proposed that the basic rental tariff for **tenants who are registered as indigent consumers** is fixed at R100,00 (one hundred Rand) per month. The Indigent Policy is regarded as amended accordingly.
- 4.3 These tariffs will apply to municipal public rental stock in ALL AREAS.
- 4.4 In order to curtail the risk of false claims of indigence from tenants, applications for registration as indigent from tenants of public rental housing stock will only be considered upon recommendation from the Department: Housing Administration

5. **COMMENTS BY RELEVANT DEPARTMENTS**

5.1 **Legal Department**

Although the downwards adjustment should have been part of the budget process, same will have no prejudice to Council in light of the fact that a substantial amount of rental is not paid by the lessees on a yearly basis. The item and recommendations are supported.

5.2 **Financial Services**

Finance supports the Item.

**RECOMMENDED**

- (a) that the tariff for services (water/sewerage/refuse removal) be based on consumption, and in the event where separate metering does not occur, the costs be proportionate to the size of the dwelling in terms of the number of bedrooms;
- (b) that the rental tariff for non-indigent household remain as is on the current basis;
- (c) that the basic rental tariff for tenants who are registered as indigent consumers be fixed at R 100,00 (one hundred Rand) per month, applicable only to the 607 units identified in par 2 above; and
- (d) that applications for registration as indigent consumers from tenants of public rental housing stock only be considered upon the recommendation from the Department: Housing Administration.

**(DIRECTOR: HUMAN SETTLEMENT AND  
PROPERTY MANAGEMENT TO ACTION)**

**8.9 REPORTING ON THE PROGRESS MADE WITH REGARD TO THE RECOMMENDATIONS OF THE OVERSIGHT COMMITTEE ON THE 2014/2015 ANNUAL REPORT**

*File number* : 9/1/4/4  
*Report by* : Executive Mayor  
*Compiled by* : Municipal Manager  
*Delegated authority* : Council

***Strategic intent of item***

Preferred investment destination	<input checked="" type="checkbox"/>
Greenest municipality	<input type="checkbox"/>
Safest valley	<input checked="" type="checkbox"/>
Dignified Living	<input checked="" type="checkbox"/>
Good Governance	<input type="checkbox"/>

**1. PURPOSE OF REPORT**

That Council take note of the progress made on the Municipal Public Accounts Committee (MPAC) Oversight Report on the Annual Report for 2014/15 that was tabled at the 30<sup>th</sup> Council meeting, dated 30 March 2016, item 7.3.

**2. BACKGROUND**

The Oversight Committee conducted the Oversight Process over 11 sittings between 1 February 2016 and 22 March 2016 and the process concluded with a presentation to the Municipal Council on 30 March 2016.

During the Oversight Process, the Oversight Committee made recommendations on the improvement of the Draft Annual Report 2014/15 which entailed minor corrections and additional information that would make the Draft Annual Report reader friendly. These improvements were made to the extent that information was available.

The Oversight Committee also made specific recommendations on issues contained in the Draft Annual Report which should be addressed by the Municipal Council.

**3. DISCUSSION**

The Chairpersons of MPAC and Oversight Committee were of the opinion that the 2014/15 Annual Report accurately reflects the performance of the Municipality for the year under review and recommend that the Council approve the 2014/15 Annual Report without reservations.

Item (c) of the resolutions requested that Council requests the Executive Mayor to report to Council on a quarterly basis on the implementation of the recommended actions in addressing the findings in the Oversight Report.

#### COMMENTS BY RELEVANT DEPARTMENTS

##### Human Resource Management

No comment required.

##### Financial

No comment required.

##### Legal

No comment required.

#### 4. FINANCIAL IMPLICATION

No financial implication applicable

#### 5. PROGRESS ON RECOMMENDATION

Below the progress made on the recommendations of the Oversight Committee

Question /Observation	Pg	Response at Oversight	Recommendations/Actions (Oversight Report)	Progress from line department
Housing	175	Verbal report was provided	Housing remains of primary concern to the oversight committee even though it is not the function of local government. It is recognised that the Stellenbosch Municipality should optimise intergovernmental relations and finalise all policy matters and plans to ensure more efficient housing delivery to the greater Stellenbosch.	There is regular interaction with the Provincial Department of Human Settlements on housing development plans and the implementation of housing projects. These interactions happen in Quarterly Regional Meetings, Monthly Technical Meetings and Monthly/ Fortnightly Site Meetings. The following is a list of policies that either have been approved by Council or are targeted for tabling to Council in the 2015/16 financial year alone. (i) Informal Settlements Upgrading Strategy, (2) Emergency Housing Assistance Policy, (3) Staff Rental Housing Allocation Policy, 2015/16 Housing Pipeline Annual Review.

Ward Committee	16	Verbal report was provided	Ward delimitation causes concerns with councillors and communities if not clearly defined and reported on. The Council should ensure that improved communication with ward councillors address any disputes on these matters. Support to ward councillors appear to be inconsistent as the supervision and activities of Ward Administrators and ward committees need to be reviewed in consultation with each ward councillor.	Administrative support for Re: Minutes of meetings has been improved for ward 22 whereby minutes are completed by Committee services.
Property Management	180	List of leases provided	Reporting on property management appears to be inadequate as the assets of Stellenbosch Municipality require more detail in the annual report and should be addressed at an operational level to ensure that regular inspections of all assets are done to verify compliance with contracts.	We are in the process of requesting that the position of head: administration is advertised. The position remained vacant for the past six years; Note, due to the position being unfunded (funds have been moved to other vacancies without consultation).
TASK	158	Submission made to Oversight Committee	The oversight committee acknowledge the effect that TASK have on the organisation and that the process has affected the morale to the extent that distrust and dissatisfaction might exist amongst members of staff. Clarity on the delegated powers to authorise payments and a full report on TASK needs to be tabled to Council including full and final cost of the whole process and the way outstanding matters will be dealt with as well as the way forward to finalise appeals and future job evaluations.	We are in the process of finalising the process of TASK. KPMG was appointed to do full assessment of the TASK process.
Macro structure	236	Reports as acknowledged by management	A section 66 report be prepared as soon as possible with reference to capacity problems found in Legal ,HR,ICT, Traffic Services etc.	The Macro structure has been identified as a KPI for the 2016/17 financial year for review before the end of June 2017.
Organisational culture	158	Observation during submissions	The MM should investigate the prevailing organisation culture and need to change as it was observed by the oversight committee that related problems and morale was raised as concerns throughout the year.	A climate survey amongst staff has been identified as a KPI for the 2016/17 financial year for review before the end of June 2017.
Geodebt	282	CFO indicated that there is compliance	Official status of Geodebt as per the letter from National Treasury and compliance to the MFMA to be reported	Refer to Annexure 1 paragraph 11.1
System of Delegation as mentioned in the Management report of the AG	99 AFS	Note 55 to the AFS	The existing (Zybrands) system of delegations be reviewed for compliance	Item for Council collabed to write off expenses
Contract management	175	List of leases provided	Dedicated staff, controls and systems be considered to ensure improved contract management, in respect of leases, service providers, etc.	SCM contract management is being reviewed by new appointed SCM resources
Unauthorised expenditure	99 AFS	Note 53 to the AFS	That Circular 68 be complied with in terms of referring irregular and fruitless and wasteful and unauthorised expenditure to MPAC	Item collabed

**RECOMMENDED**

that Council take note of the progress made on the recommendations of the Oversight Committee.

**(ACTING MUNICIPAL MANAGER TO ACTION)**



# APPENDIX 1



**national treasury**

Department:  
National Treasury  
REPUBLIC OF SOUTH AFRICA

Private Bag X115, Pretoria, 0001

Enquiries: Phaladi Moshane Tel: (012) 316 5115 Fax: (012) 326 5445 Email: [phaladi.moshane@treasury.gov.za](mailto:phaladi.moshane@treasury.gov.za)

Ref: 43/1/2/5/1

Ms C. Liebenberg  
Municipal Manager  
Stellenbosch Municipality  
PO Box 17  
STELLENBOSCH  
7600

Dear Ms Liebenberg

**DRAFT REPORT ON THE VERIFICATION OF COMPLIANCE WITH TREASURY NORMS AND STANDARDS DURING THE PARTICIPATION ON BID NO: 08/2/11/27 STELLENBOSCH MUNICIPALITY**

This report contains the findings of National Treasury's review of compliance with norms and standards during the bidding process.

Kindly receive the report for your attention.

Kind regards.

A handwritten signature in black ink, appearing to read 'Solly Tshitangano'.

**SOLLY TSHITANGANO**  
**CHIEF DIRECTOR: GOVERNANCE MONITORING AND COMPLIANCE**

DATE: 11 May 2015



**national treasury**

Department:  
National Treasury  
REPUBLIC OF SOUTH AFRICA

**REPORT ON THE VERIFICATION OF COMPLIANCE WITH TREASURY NORMS AND STANDARDS DURING THE PARTICIPATION ON BID NO: 08/2/11/27 STELLENBOSCH MUNICIPALITY.**

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**REPORT ON THE VERIFICATION OF COMPLIANCE WITH TREASURY NORMS AND STANDARDS DURING THE PARTICIPATION ON BID NO: 08/2/11/27 STELLENBOSCH MUNICIPALITY.**

**1. INTRODUCTION**

- 1.1 This report contains the findings of National Treasury's review of the process followed in leading to the appointment of Geodebt Solutions cc by Stellenbosch Municipality under a contract secured by Witzenberg Municipality.
- 1.2 Geodebt Solutions CC was appointed for provision of debt collecting and credit control support services.
- 1.3 National Treasury has reviewed the documents provided by your entity as well as other documents relevant to the tender, and would like to bring the issues identified during the review to your attention as indicated below.

**2. DEMAND CONSIDERATIONS**

- 2.1 There is no indication that demand management process was adhered to. The objective of the demand management process is to ensure that the goods and services required to fulfill the needs identified in the strategic plan of the institution are delivered at the right time, price and place and that the quantity and quality will satisfy those needs of the user

**3. DEVELOPMENT OF BID SPECIFICATION**

- 3.1 Services were procured under a contract secured by another Municipality.

**4. ADVERTISEMENT OF THE TENDER**

- 4.1 Services were procured under a contract secured by another Municipality.

**5. OPENING AND RECORDING OF BIDS**

- 5.1 Services were procured under a contract secured by another Municipality

**6. EVALUATION OF THE TENDER**

- 6.1 Services were procured under a contract secured by another Municipality

**7. ADJUDICATION OF THE TENDER**

- 7.1 The minutes of the Bid Adjudication Committee were provided.
- 7.2 The meeting held on 31 October 2013 was chaired by Mr HG Vergotine
- 7.3 There was no interest to declare by members.

7.4 The Geodebt Solutions CC was recommended for award for a 3 year period provided that expenditure is within the allocated budget.

7.5 Further that the bid document serves as a service level agreement.

ITEM	1 November 2013 to 30 June 2014	1 July 2014 to 30 June 2015	1 July 2015 to 30 June 2016
Monthly Fee (incl.VAT)	R 54 720.00	R 58 000.00	R 61 480.00

## 8. APPROVAL BY THE ACCOUNTING OFFICER

8.1 The appointment letter was signed by Mr HG Vergotine on 31 October 2013.

8.2 The contract commenced on 01 November 2013 and is ending on 30 June 2016.

## 9. CONTRACT SERVICE LEVEL AGREEMENT

9.1 No service level agreement concluded.

## 10. REQUEST FOR PARTICIPATION

10.1 Stellenbosch Municipality submitted a request for participation in a contract organized by Witzenberg Municipality on 06 January 2014.

10.2 The letter of request was signed by the Chief financial officer, Mr M Wust.

10.3 The Witzenberg Municipality gave approval to Stellenbosch Municipality to participate in the contract on 20 January 2014.

10.4 The letter of consent confirmed the following:

10.4.1 That the contract was organized through a competitive bidding process;

10.4.2 The contract was validly procured; and

10.4.3 Proposal submitted by bidders were subjected to a fair process and Geodebt Solutions cc was in all respect the best acceptable bid.

10.5 It is further confirmed that below documents were submitted to the Stellenbosch Municipality:

10.5.1 Copy of contract between Witzenberg Municipality and Geodebt Solutions cc;

10.5.2 Bid documents of Geodebt solutions cc;

10.5.3 Minutes of the Bid Adjudication Committee meeting held on 31 October 2013,

10.5.4 Appointment letter of Geodebt Solutions cc;

10.5.5 Copy of advert. and bids opening register.

## Original tendered price

<b>SUMMARY OF FEES CHARGED TO WITZENBERG MUNICIPALITY</b>			
<b>Description</b>	<b>Days</b>	<b>2014/2015</b>	<b>2015/2016</b>
Geo Plus system		R 9 500.78	R 10 070.83
1 x Manager	Full time	R 22 299.22	R 23 637.17
1x Manager legal	5 days per month	R 8 480.00	R 9 988.80
1x Project manager credit control	2 days per month	R 4 240.00	R 4 494.40
1x Project Manager System support	2 days per month	R 8 360.00	R 6 741.60
<b>Grand Total</b>		<b>R 50 880.00</b>	<b>R 53 932.80</b>
<b>SLA per month</b>		<b>R 58 003.20</b>	<b>R 61483.39</b>

## Extended Contract

<b>SUMMARY OF FEES CHARGED TO STELLENBOSCH MUNICIPALITY</b>			
<b>Description</b>	<b>Days</b>	<b>2014/2015</b>	<b>2015/2016</b>
Geo Plus system		R 114 009.36	R 120 849.96
3 x Manager	Full time	R 802 771.92	R 850 938.12
1x Manager legal	8 days per month	R 162 816.00	R 172 584.96
1x Project manager credit control	6 days per month	R 152 840.00	R 161 798.40
1x Project Manager System support	2 days per month	R 76 320.00	R 80 899.20
<b>Grand Total</b>		<b>R 1 491 755.30</b>	<b>R 1 581 260.53</b>
<b>SLA per month</b>		<b>R 124 312.94</b>	<b>R 131 771.71</b>

- 10.6 The table above demonstrates price comparisons between the two service level agreements signed with Geodebt Solutions cc.
- 10.7 The rates charged to Stellenbosch Municipality do not differ from the original rates charged to Witzenberg Municipality.
- 10.8 Geo plus System fee of R 114 009.36 when divided by 12 months it equals the rate of R 9 500. 78 per month reflected on the original contract.
- 10.9 The scope of work was slightly greater for the extended contract in that 2 more human resources were assigned on the project and 7 extra days were added.

**Contract / Service level Agreement**

- 10.10 The service level agreement was signed by Ms C Liebenberg, on 24 June 2014.

**11- CONCLUSION**

- 11.1 The Stellenbosch Municipality complied with Regulation 32 of the Municipal Supply Chain Management regulations.
- 11.2 There were no reasons advanced why the Municipality wanted to participate in a contract organized by another organ of state.
- 11.3 The scope of work was slightly greater than that of the original contract and the rates charged by the supplier were same.

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9. **CONSIDERATION OF NOTICES OF QUESTIONS AND NOTICES OF MOTIONS  
RECEIVED BY THE SPEAKER** (3/4/1/4)

NONE

10. **CONSIDERATION OF MOTIONS OF EXIGENCY** (3/4/1/4)

NONE

11. **MATTERS FOR INFORMATION**

11.1 **REPORT BY THE EXECUTIVE MAYOR ON DECISIONS TAKEN BY THE  
MAYORAL COMMITTEE AND STANDING COMMITTEES FOR THE PERIOD  
MAY 2016** (3/4/2/5)

*Report by the Executive Mayor*

In terms of Section 56(5) of the Municipal Structures Act, No 117 of 1998, the Executive Mayor must report to the Municipal Council on all decisions taken by the Mayoral Committee and Standing Committees.

The above-mentioned information is attached as **APPENDIX 1**.

**FOR INFORMATION**



**11.2 DECISIONS TAKEN IN TERMS OF DELEGATED AUTHORITY BY THE EXECUTIVE MAYOR FOR THE PERIOD APRIL 2016 (3/5/1/1)**

NONE

**12. OTHER URGENT MATTERS SUBMITTED BY THE MUNICIPAL MANAGER (8/1/3/2/7)**

NONE

**13.1 CONSIDERATION OF REPORTS SUBMITTED BY THE SPEAKER (8/1/3/2/9)**

**13.1.1 INVESTIGATION INTO ALLEGATIONS OF BREACH OF THE CODE OF CONDUCT FOR COUNCILLORS: COUNCILLOR AT VAN DER WALT**

*File number* : 3/6/4

*Report by* : Speaker

*Compiled by* : Liaison Official: Office of Speaker

*Delegated authority* : Council

**1. PURPOSE OF REPORT**

The Disciplinary Committee has been established in terms of item 14(1)(b) of the Code of conduct for Councillors, promulgated as Schedule 1 to the *Local Government Systems Act, 2000 (Act No 32 of 2000)*, to invest and make a finding on any alleged breach of the Code and to make appropriate recommendations to Council.

This is a report from the Disciplinary Committee to inform Council on the outcome of the disciplinary enquiry of Councillor Van Der Walt. The outcome of the matter is reported to Council as a statutory requirement, in terms of item 13(1)(c) of the said Code.

**2. BACKGROUND**

The Speaker received a handwritten letter from Councillor AT Van Der Walt in which he admit that he arrange for the brake down of the Ekanini wall.

Two charges were brought against Councillor A Van Der Walt.

**Charge 1:** Councillor Van Der Walt was charged after he allegedly damaged Council's property by giving instructions that a wall must be broken down.

**Charge 2:** As a result of first charge, Councillor Van Der Walt was further charged for causing fruitless and/or wasteful expenses as envisaged by Section 32 of the Local Government: Finance Management Act No. 56 of 2003.

### 3. DISCUSSION

This report deals with the alleged contravention of the Code of Conduct for Councillors by Councillor Van Der Walt, who was charged with two offences as set out above.

Item 2 of the Code of Conduct for Councillors state:

**2. A councillor must—**

- (a) *perform the functions of office in good faith, honestly and a transparent manner: and*
- (b) *at all times act in the best interest of the municipality and in such a way that the credibility and integrity of the municipality are not compromised.*

The Disciplinary Committee has been delegated by Council to receive reports of alleged transgressions from the Speaker in terms of item 14(1)(b) of the Code of Conduct for Councillors, to investigate and make findings on any alleged breach of the Code and to make appropriate recommendations to Council on a suitable penalty.

On 12 August 2015 the Disciplinary Committee conducted a hearing.

The Disciplinary Committee gave a verdict that Cllr Van Der Walt was found guilty on both charges.

Councillor Van Der Walt was given an opportunity to address the Disciplinary Committee to consider mitigating factors for a possible sanction. Councillor Van Der Walt did not address the Disciplinary Committee and reserved his rights to the process.

The Initiator was given the opportunity to address the Disciplinary Committee. He argued that this offence as set out in charge 1, must be seen in a very serious light, as all Councillors are holding a fiduciary duty to represent the Community and the Council in the best of all interests. He further argued that Councillors cannot take the law in their own hands. He proposed that charge 1 be dealt with in terms of Item 14 (2) (e) which constitutes removal of office.

In terms of Item 14 of Schedule 1 of the aforesaid act:-

**“14. Breaches of Code**

- (1) ...
- (2) *If the council or a special committee finds that a councillor has breached a provision of this Code, the council may -*
  - (a) *issue a formal warning to the councillor;*
  - (b) *reprimand the councillor;*

- (c) *request the MEC for local government in the province to suspend the councillor for a period;*
- (d) *fine the councillor; and*
- (e) *request the MEC to remove the councillor from office.*

The Disciplinary Committee has taken all arguments and circumstances into account, and recommends that Cllr Van Der Walt be sanctioned as follows:

**Charge 1:** That Cllr Van Der Walt be removed from office and that such request be send to the MEC, as provided for in Item 14(2)(e);

**Charge 2:** That the contravention of Section 32 of the Local Government:

Finance Management Act No. 56 of 2003, be investigated by MPAC, and that an appropriate recommendation be made to Council by MPAC.

#### 4. COMMENTS BY RELEVANT DEPARTMENTS

None required.

#### RECOMMENDED

- (a) that Cllr Van Der Walt be removed from office and that such request be send to the MEC, as provided for in Item 14(2)(e);
- (b) that the contravention of Section 32 of the Local Government: Finance Management Act No. 56 of 2003, be investigated by MPAC, and that an appropriate recommendation be made to Council by MPAC.
- (c) that Council accept the sanction from the Disciplinary Committee; or
- (d) that Council apply its own sanction as prescribed by the Code of Conduct for Councillors item 14(2), which states:

*“(2) If the Council or a special committee finds that a Councillor has breached a provision of this Code, the Council may—*

- (a) issue a formal warning to the Councillor;*
- (b) reprimand the Councillor;*
- (c) request the MEC for local government in the province to suspend the Councillor for a period;*
- (d) fine the Councillor; and*
- (e) request the MEC to remove the Councillor from office”.*

- (e) that the chairperson report the outcome of the investigation to the MEC for local government.

**5. FURTHER COMMENTS**

On 5 October 2015 the Speaker reported the outcome of the disciplinary hearing as resolved by Council on 23 September 2015 to the MEC for Local Government.

On 2 February 2016 the MEC wrote to Cllr Van der Walt requesting him to comment on the alleged breach.

On 6 June 2016 the Speaker received a letter from the MEC where the MEC state that he concur with the guilty finding and recommended sanction and that Cllr Van der Walt be removed as a Councillor (**APPENDIX 1**).

The Speaker informed Cllr Van der Walt by hand delivered letter on 06 June 2016 of the decision made by the MEC and that he are removed as a Councillor of Stellenbosch Municipality with immediate effect (**APPENDIX 2**).

**RECOMMENDED**

that Council note the recommendations made by the MEC for Local Government Minister A Bredell.

**(OFFICE OF THE SPEAKER TO ACTION)**

# APPENDIX 1

*APP. 1*

REFERENCE: 3/11/2/25 (2014/571)

The Speaker  
Stellenbosch Municipality  
PO Box 17  
**STELLENBOSCH**  
7599

Fax: (021) 808 8988

Dear Councillor Jooste

**CODE OF CONDUCT FOR COUNCILLOR: A VAN DER WALT**

The council of the Stellenbosch Municipality considered a Disciplinary Committee report dated 23 September 2015, and requested me to remove Councillor van der Walt from office. The investigation by the Municipal Council was occasioned by the allegations that he contravened Item 2 of the Code of Conduct, as contained in the Local Government: Municipal Systems Act (32 of 2000).

It was alleged that Councillor van der Walt, during January 2014, wrote a letter to the Speaker of the Stellenbosch Municipality relating to the destruction of municipal property by indicating that "ek het gereël met my structure op grondvlak dat die muur van R432 000 afgekap word. As 'n saak teen my gemaak word sal ek met trots sê dat ek dit gedoen het en sal ek met plesier tronk toe gegaan het".

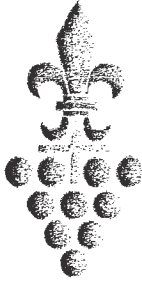
After considering all the relevant information provided to me, including but not limited to the relevant council resolutions, transcripts of the proceedings and submissions, I concur with the guilty finding and recommended sanction by the Stellenbosch Municipality, and hereby remove Mr A van der Walt as councillor.

Yours faithfully,



A BREDELL  
**MINISTER**  
DATE: 2 June 2016

# APPENDIX 2



STELLENBOSCH  
STELLENBOSCH • PNIEL • FRANSCHHOEK

BY HAND

MUNICIPALITY • UMASIPALA • MUNISIPALITEIT

OFFICE OF THE SPEAKER

Ref No: AvdW/0606/16

06 June 2016

Councillor A Van Der Walt  
77 La Clemance  
Jamestown  
Stellenbosch  
7600

Dear Councillor

**CORRESPONDENCE FROM MEC A BREDEL**

Please find attached self-explanatory correspondence from MEC Anton Bredell.

The MEC concur with the guilty finding and the recommended sanctions by Stellenbosch Municipality.

Therefore you are hereby informed that you are removed as a Councilor of the Stellenbosch Municipality with immediate effect and that the outcome of the investigation by MPAC will be communicated to you in due course.

Regards.

Alderman C P JOOSTE  
**SPEAKER**

021 808 8074

mailto:[Cyril.Jooste@stellenbosch.gov.za](mailto:Cyril.Jooste@stellenbosch.gov.za)



**13.2 CONSIDERATION OF REPORTS SUBMITTED BY THE EXECUTIVE MAYOR  
(8/1/3/2/9)**

NONE

**14. MATTERS TO BE CONSIDERED IN-COMMITTEE**

(SEE PINK DOCUMENTATION)