GEORGE AEROTROPOLIS (Pty) Ltd.

ELECTRICAL SERVICES REPORT

FOR

PROPOSED DEVELOPMENT ON PORTIONS 130, 131 AND 132 OF THE FARM GWAYANG NO. 208, GEORGE

REPORT NO: G/11832/R

Revised: 1 October 2021

Prepared by:
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cmb
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CONSULTING MECHANICAL

INDEX

1.0 INTRODUCTION

This report has been prepared by Clinkscales Maughan-Brown (CMB) at their George office, who have been appointed by the Developer, as the Electrical Consultants for this project. The purpose of this report is to provide the necessary information on the proposed electrical services within this Development and the connection to the existing municipal network in the area, in order to obtain all the necessary statutory approvals and to draw up a services agreement.

2.0 LOCATION

The planned development is on Portions 130, 131 and 132 of the farm Gwayang 208, located near the George Airport.

The properties to be developed has the following existing municipal approvals and zonings:

- Portion 131 – Business Zone VI (filling station and ancillary services).
- Portion 132 – Agriculture Zone II (small holding) with consent for tourist facilities (theatre, crafts market, curio shop, micro-brewery, museum and info centre)
- Portion 130 – General residential Zone VI (hotel) and Agriculture Zone II (small holding) with consent for tourist facilities.

The proposed development includes for the properties to be subdivided and rezoned as Industrial Zone I (light industry) and indicated on Drawing No. 11832/E/01, which is attached as Annexure A.

3.0 SUPPLY AUTHORITY

The Supply Authority for the area is George Municipality, and therefore their Electricity Department was consulted on matters related to the electrical services.

4.0 BASIS OF REPORT

The report is based on the following:

(i) CMB Services Report No. G/11832/E/R1 dated 21 November 2018.
(ii) Guidelines for distribution connection charges for loads (NRS 069:2018 Edition 2).
(iii) Site development plan received on 23 September 2021 from Messrs Bam Architects.
(iv) Information obtained from Mr Steyn vd Merwe, the previous head of planning at George Municipality's Electricity Department, during a meeting held on 23 August 2021.
(v) Site inspection with Mr. Sarel du Preez from George Municipality's Electricity Department on 26 August 2021.
(vi) Information obtained from Messrs Deon Esterhuysen and Kobus Wilken from George Municipality's Electricity Department, during a meeting held on 3 September 2021.
(vii) General information received from the Client and other members of the professional team of this and the adjacent developments.

5.0 DEMAND

Based on the information currently available, the peak kVA demand of the Development has been estimated at 984kVA after diversity demand as detailed in Annexure B.

This is a provisional calculation and will be finalized after all the network load particulars have been concluded.

The following objectives will be set to reduce consumption:

- Comply with SANS 10400.
- Energy efficient light fittings, air conditioning, mechanical ventilation, refrigeration and water heating installations, electric motors, etc.
- Use of LPG gas instead of electrical appliances for cooking where economically feasible.
- Use of energy efficient appliances.
- Building and plant load management systems to reduce power consumption in the case of the industrial erven.
- Installation of Photo Voltaic (PV) and other Small Scale Embedded Generators (SSEG), where it can be economically justified.

It is expected that with the implementation of these measures, consumption could be reduced by approximately 20%.

6.0 AVAILABILITY OF CAPACITY

Based on the municipal approval which is already in place, the capacity for which approval has already been received is as follows:

Portion 131	10kVA
Portion 132	10kVA
Portion 130	10kVA
Total	30kVA

The new capacity is estimated at 984kVA. Thus, the additional capacity required is estimated at 954kVA.

The Municipality previously indicated that some 103kVA is available on the existing network in the area. Additional capacity will have to be transferred to the site by the link services to be provided, as indicated under Item 7.0 below.

As part of the environmental approval process, a letter of confirmation on the availability of capacity is normally required from George Municipality's Electrical Department.

7.0 BULK AND LINK SERVICES

It is envisaged that the planned Airport Support Zone developments (Gwayang 208 Portions 4, 130, 131, 132 and 139) will be supplied from a new 11kV switching station to be established as near as possible to the intersection of the R102 and the R404. This switching station will be linked to the Municipality's existing Heatherpark 66/11kV substation via the existing and proposed "Mulberry" 11kV overhead lines on a ring supply. In future this supply will be connected to the Proefplaas Substation after the necessary 66/11kV transformer bay has been established, which is in line with the Gwayang Local Spatial Development Framework dated September 2015.

The proposed network strengthening required to make the additional capacity for the Airport Support Zone developments available, is as follows and as indicated on attached Drawing No. 11832/E/01:

- Upgrading of ±2700 metres of existing 32mm² Cu "Airport" 11kV overhead line between pole no's SL46 and 85 to "Mulberry" conductor. This line runs along the R102 and in a servitude along the southern boundary of adjacent Erf 4/208, and is the present main supply to the Airport.
- Upgrading of ±890 metres of existing 16mm² Cu horizontal construction 11kV overhead line near the Haygrove Farm between pole no's US13 and 37 to "Mulberry" conductor. Alternatively a new section of "Mulberry" overhead line could be constructed along the R404 to by-pass the aforementioned section.

- New brickbuilt 11kV switching station building to be located in the proposed position as indicated in the south eastern corner of Erf 5 of the proposed development on Erf 4/208.
- Two 11kV incomer circuit breakers, four 11kV feeder circuit breakers and a bus-section switch inside the abovementioned switching station building.
- New 300mm² Al 11kV underground cable between existing "Mulberry" overhead line pole no. USWL7 and the new 11kV switching station.
- New 300mm² Al 11kV underground cable between the upgraded "Mulberry" overhead line pole no. 85 and the new 11kV switching station.
- New 70mm² Al 11kV underground cable between new overhead line terminal pole no. 85/1 and the new 11kV switching station, to reconnect the main supply to the Airport.
- Relocation of the existing 70mm² Al 11kV 2nd cable feeding the Airport, currently terminated at pole no. USWL7, to the new switching station.

The abovementioned will allow an estimated additional firm capacity of 3500kVA to be transferred to the Airport Support Zone. All developments in this Zone should be required to make a contribution towards this link services cost on a pro-rata basis as described under Item 12.0 below.

It is proposed that the points of connection to the existing municipal network be as indicated on the drawing.

8.0 INTERNAL SERVICES

This development will be supplied from a 185mm² Al 11kV underground ring cable which is connected at the abovementioned new switching station as indicated on the drawing.

All cables and electrical equipment will be installed in servitudes, road reserves and open spaces and will be accessible to the Municipality at all times.

It is proposed that the Municipality take-over the entire internal electrical network on completion thereof. The Municipality will become the owner and be responsible for operating and maintaining same. For this reason, the installation would have to comply with their technical requirements and supply conditions.

The point of connection for each of the individual erven will be at the low voltage busbars of the proposed miniature substations. Each individual consumer will be responsible for the supply and installation of the service connection cable between the miniature substation and the erf when this service is required.

It is envisaged that bulk metering points will be made available at low voltage depending on the actual demand of the supplies required. The point of supply for each portion will be finalised once more detailed information is available.

Each consumer will have to enter into a separate supply agreement with the Municipality and the standard municipal tariffs will be applicable.

Streetlights along public roads will be in accordance with the municipal standards and those along private roads may not be the municipal standard. The latter type will not be taken-over, must be separately metered, and will have to be maintained by the Body Corporate / Home Owners Association.

9.0 TECHNICAL PARTICULARS

All drawings and specifications of the proposed network must comply with the Municipality's technical requirements and must be submitted to them for official approval before any construction can commence.

The new 11kV switching station will be a brick building (±10m x ±5m) and be located on a separate erf or servitude dedicated for this purpose.

The 11kV switchgear to be installed inside the new switching station will be the metal-enclosed, indoor, compact, modular, vacuum type, similar to the ABB Safeplus.

The 11kV cable type will be the paper insulated, lead covered with three stranded aluminium conductors, Table 17.

The distribution substation/s will be the fully enclosed miniature type housing a 11kV ring main unit of the SF6 insulated ABB or similar type, 11kV/420V transformer and low voltage (LV) distribution equipment and area lighting control equipment.

The Low Voltage (LV) network will not be installed by the Developer.

Public road streetlights will be the municipal standard luminaire mounted on a galvanised steel pole. Private road lights could be a different type to suit the architectural theme.

The internal network will be designed so that any internal faults do not cause nuisance tripping of the upstream municipal network.

No switching of supplies or work in close proximity of existing cables / overhead lines will be carried out without prior arrangement with the Municipality's electrical department. The Electrical Contractor will also be required to liaise with the Municipality's civil department and communication service provider/s to ensure that no damage is caused to existing underground piped services during construction.

10.0 ENVIRONMENTAL REQUIREMENTS

All work will comply in all respects with the relevant environmental management requirements.

11.0 PROGRAMME

The development will be phased. It is expected that construction of services will commence immediately after all the necessary approvals have been received and the feasibility has been accepted. It is expected that the total peak demand of the development will be reached over a period of between 1 and 10 years.

12.0 CAPITAL COSTS

The Developer will be responsible for the following:

(i) Supply and installation of link services to establish additional capacity in the area of the development. Based on the abovementioned proposal and layout, the total cost is roughly estimated at R7.5M, excluding VAT and escalation. This cost should be shared on a pro-rata basis based on the demand of the proposed Airport Support Zone developments.

(ii) Supply, installation and commissioning of the complete internal network and connecting to the new 11kV switching station as described above.

(iii) Standard municipal development charges towards bulk infrastructure to be calculated by George Municipality. It is understood that a new guideline was recently compiled in this regard, and that there are numerous considerations when these calculations are to be done. It is proposed that the calculations be discussed with the Developer before same is finalized and the services agreement is compiled.

Of particular importance is the level at which the Development is taken to connect in the shared network, and thus its contribution to shared networks. In view of the significant link services to be provided by the Developer which will also benefit existing as well as other future developments in the airport area, it is proposed that this cost be credited against the development contributions payable. Consideration could also be given that the level of connection for the purposes of the calculation be at HV/MV level, which will ultimately be at the SS-Proefplaas 66/11kV Substation.

All work will be done under the direction of the Developer's Electrical Consultant, i.e. Messrs Clinkscales Maughan-Brown, and by an Electrical Contractor to be approved by the Developer and the Municipality.

13.0 CONCLUSION

We trust that this information is sufficient to obtain the necessary statutory approvals for the development and to draw up the services agreement.

Please contact the writer should more information be required.

In order to speed-up the process, we will also forward a copy of this report directly to the Municipality's electrical department, for their approval and any further comments they may have.

R.L. Steenekamp Pr Eng Pr CPM
CLINKSCALES MAUGHAN-BROWN

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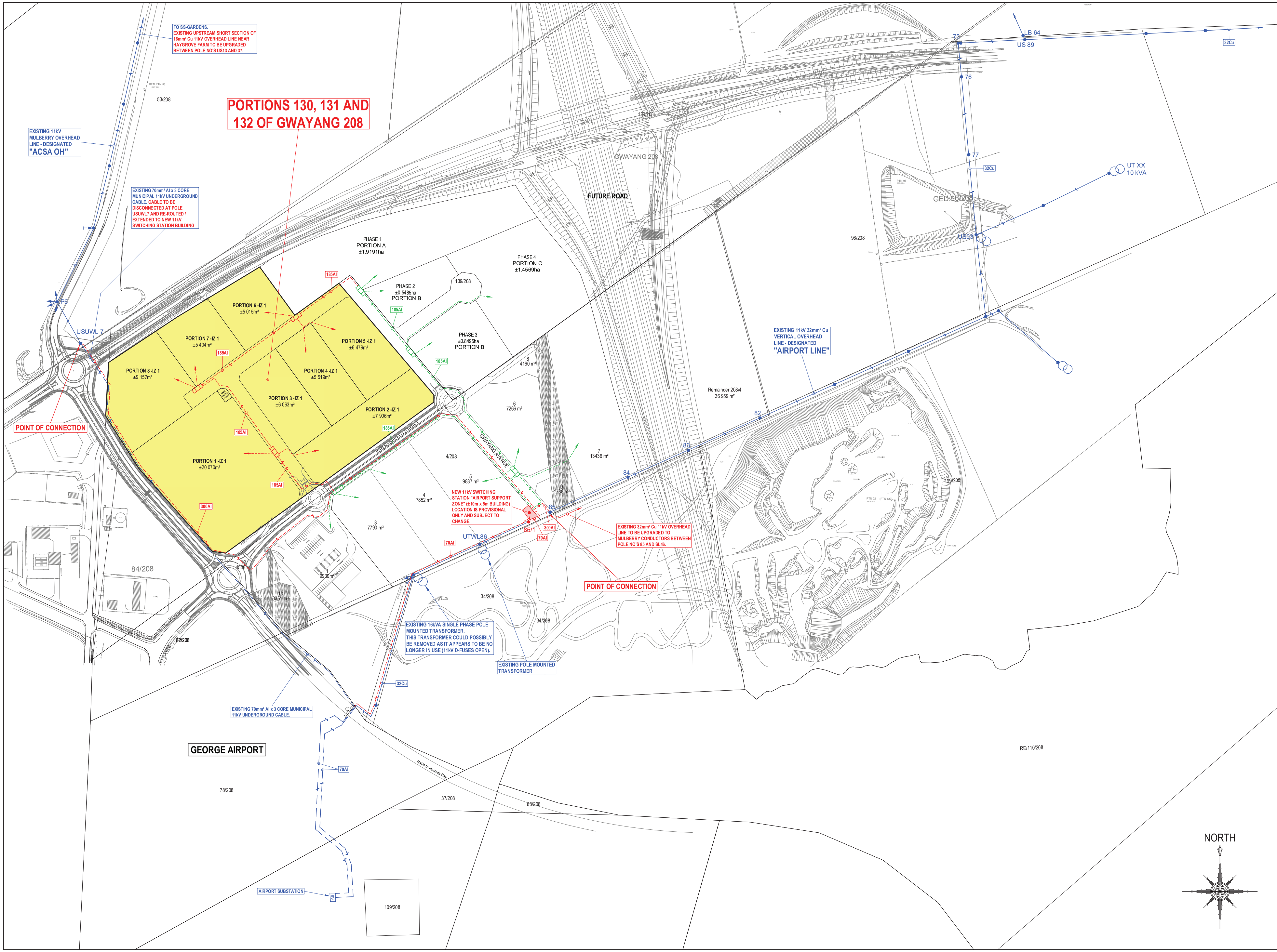
ANNEXURE A

Drawing No: 11832/E/01 – Plan layout of proposed MV electrical network.



LEGEND

- 11kV UNDERGROUND CABLE
- 11kV OVERHEAD LINE
- RMU 11kV RING MAIN UNIT (RMU)
- MINIATURE SUBSTATION
- EXISTING (BLUE)
- PLANNED (RED)
- FUTURE / BY OTHERS (GREEN)

REVISIONS

No.	DATE	DRAWN	DESCRIPTION
D	30/09/2021	MvM	REVISED SDP

cmb

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CESA

CLIENT: GEORGE AEROTROPOLIS (PTY) LTD

PROJECT: PROPOSED DEVELOPMENT ON PORTIONS 130, 131 AND 132 OF THE FARM GWAYANG NO. 208, GEORGE

DRAWING TITLE: PLAN LAYOUT OF PROPOSED MV ELECTRICAL NETWORK

DRAWN	DESIGNED	CHECKED	APPROVED
MvM	RLS	RLS	
SCALE	**DATE**	**CAD REF No.**	**DWG-SIZE**
1:2000	26/10/2018	11832-E-01	A1

DRAWING NO: 11832/E/01 — REVISION: D

ANNEXURE B

Electrical Load Estimate

CLINKSCALES MAUGHAN-BROWN: ELECTRICAL LOAD ESTIMATE

PROJECT: **Proposed development on Portions 130, 131 and 132 of Gwayang 208, George**
DATE: **01-Oct-21**
DRAWING REFERENCE: **11832**

Erf No.	Zoning	Erf m²	kVA per m² (NRS069)	Coverage *	kVA at Transformer LV busbar	Diversity factor **	ADMD kVA at Point of Connection
	EXISTING ZONINGS						
208/131	Business Zone VI	9,868			10	1.00	10
208/132	Agriculture Zone II (Tourist facilities)	8,120			10	1.00	10
208/130	General Residential Zone VI	40,880			10	1.00	10
208/130	Agriculture Zone II (Tourist facilities)	18,682					
	Existing capacity	77,550					**30**
	PROPOSED ZONINGS						
Portion 1	Industrial Zone 1	20,070	0.04	0.75	602	0.50	301
Portion 2	Industrial Zone 1	7,906	0.04	0.75	237	0.50	119
Portion 3	Industrial Zone 1	6,063	0.04	0.75	182	0.50	91
Portion 4	Industrial Zone 1	5,519	0.04	0.75	166	0.50	83
Portion 5	Industrial Zone 1	6,479	0.04	0.75	194	0.50	97
Portion 6	Industrial Zone 1	5,015	0.04	0.75	150	0.50	75
Portion 7	Industrial Zone 1	5,404	0.04	0.75	162	0.50	81
Portion 8	Industrial Zone 1	9,157	0.04	0.75	275	0.50	137
Elect Switching		150	0.00	0.75	0	0.50	0
Road Reserve		37,493	0.00	0.75	0	0.50	0
	New capacity	103,256			1,968		**984**
	Additional capacity						**954**

* Coverage is used in calculation instead of FAR due to typical development in George and George network circumstances.
** Diversity between various loads downstream from the 11kV Point of Connection to calculate development contributions.