

TSANTSABANE LOCAL MUNICIPALITY



TSANTSABANE MIXED TYPOLOGY AND INTEGRATED INFRASTRUCTURE PROJECT

OUTLINE SCHEME REPORT

June 2017

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Tsantsabane Local Municipality

POSTMASBURG HOUSING DEVELOPMENT

OUTLINE SCHEME REPORT: ELECTRICAL ENGINEERING SERVICES

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Tsantsabane Local Municipality

POSTMASBURG HOUSING DEVELOPMENT

OUTLINE SCHEME REPORT: ELECTRICAL ENGINEERING SERVICES

Part A General Matters

Section A1 Background

The Tsantsabane Local Municipality (TLM) is located in the Z.F. Mgcawe District Municipality of the Northern Cape in South Africa

The TLM recognized that economic activity associated with mining, agriculture and manufacturing has increased the demand for sustainable and adequate housing in their area of jurisdiction. Furthermore, the Municipality faces multiple challenges including demand and supply imbalances, aging infrastructure, services backlogs, cost recovery insufficiencies and an overall lack in funding.

Upon this background, a 4460 unit integrated mixed housing typology development in the TLM was approved by the Municipality for development and the Department of Cooperative Governance, Human Settlements and Traditional Affairs of the Northern Cape Province ("COGHSTA"). The abovementioned development is aimed to address some of the challenges and inadequacies previously identified specifically for the provision of housing opportunities and will be characterised partially as an Informal Settlement Upgrading Development as well as an Integrated Residential Development.

Bigen Africa Services (Pty) Ltd was appointed by the TLM through a competitive procurement process for the rendering of professional services associated with the project. A Service Level Agreement (SLA) was also signed between the parties detailing Bigen Africa's role and responsibilities.

Consequently, Bigen Africa Services (Pty) Ltd has been appointed for the preparation of the Electrical Engineering Services Outline Scheme Report for the township establishment application for the proposed townships.

The scope of this report is to present the findings of the investigation into the presence and capacity of bulk Electrical Engineering Services infrastructure within the vicinity of the proposed township as determined by the investigations as well as taking into consideration the municipality's master planning report compiled by the council's consultants; Heyns van Rooyen. The report will also address the proposed upgrades required to support the development.

Section A2 Project Brief

The Postmasburg Housing Development ("the Project") will be developed in line with the Upgrading of Informal Settlement Programme (ISUP) for planning and installation of services, but the project also intends to capture the principles of the Integrated Residential Development Programme (IRDP) for the construction of subsidized housing units. The intention is to cater for an extended market, ranging from fully subsidized housing, to partly subsidized units, rental units, non-subsidized bonded housing stands, commercial stands and stands for other amenities, by formalizing the existing informal settlement areas where possible and develop new Greenfield areas for those areas which cannot be formalized due to land constraints and/or geotechnical limitations.

The Project is split into two main portions namely; Greenfields and Mountain View. The existing townships namely; Newtown and Postdene 1 & 2 will be formalised as part of this project. The 'Greenfields' portion is situated in the North-Eastern quadrant of Postmasburg, while the area earmarked for formalization is situated in the South-Western quadrant. The proposed land uses contained in the layouts of Mountain View and Greenfields are as summarise in Table A2.1 and A2.2, below.

Table A2.1 – Mountain View: Proposed Land Uses

Zoning	Land Use	No of Stands	Extent (ha)
<i>Subsidised Housing</i>	<i>Residential (350m² Erven)</i>	2600	102.57
<i>Business Premises</i>	<i>Business</i>	6	3.04
<i>Special Zone</i>	<i>Bus Stop/Taxi Rank</i>	3	1.39
<i>Place of Instruction</i>	<i>Primary/Secondary School</i>	2	6.02
	<i>Primary School</i>	1	3.66
	<i>Day-care/Crèche</i>	2	0.977
<i>Place of Worship</i>	<i>Church</i>	3	0.776
<i>Institution</i>	<i>Community Facility</i>	4	2.0645
	<i>Clinic</i>	2	0.97
<i>Municipal Uses</i>	<i>Municipal</i>	4	1.64
<i>Public Parks</i>	<i>Open Spaces</i>	22	24.567
<i>Sports Fields and Related Infrastructure</i>	<i>Sports Field and related infrastructure</i>	2	3.8114
<i>Public Street</i>	<i>Streets</i>		40.0716
<i>Minor Roads</i>	<i>30m road</i>		6.1511
TOTAL		2651	197.7086

Table A2.2 – Carnation/Greenfields: Proposed Land Uses

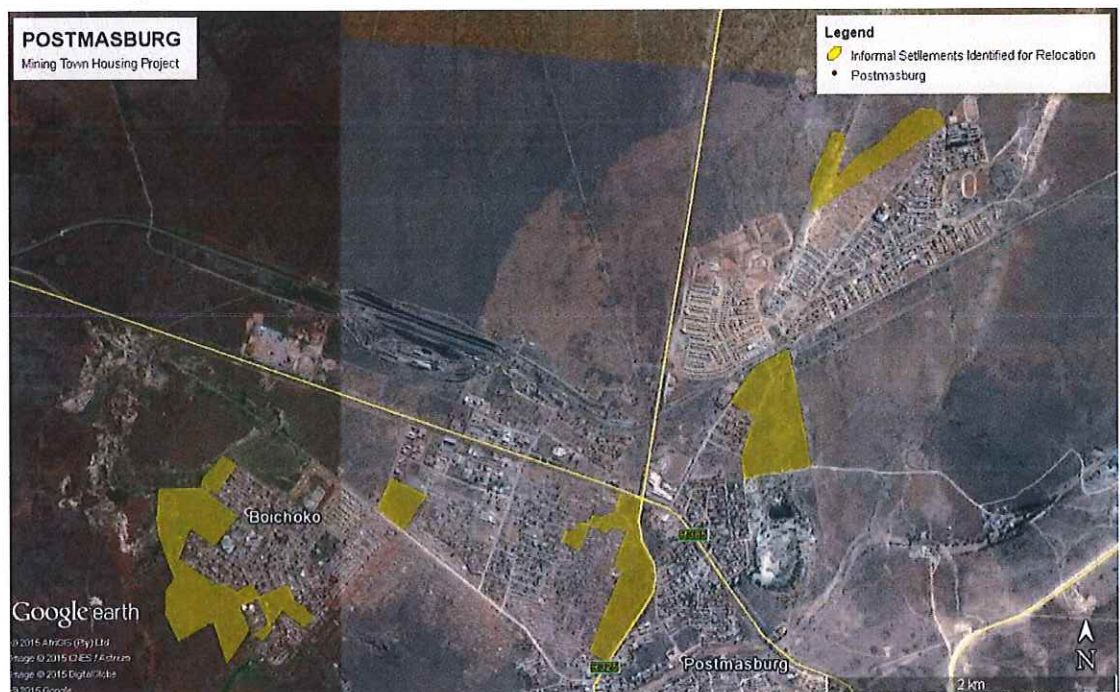
Zoning	Land Use	No of Stands	Extent (ha)
<i>Subsidised Housing</i>	<i>Residential</i>	2158	86.5
<i>Business</i>	<i>Business</i>	2	2.0129
<i>Special Zone</i>	<i>Bus Stop/Taxi Rank</i>	2	1.1682
<i>Place of Instruction</i>	<i>Secondary School</i>	1	3.9512
	<i>Primary/Secondary School</i>	1	5.5817
	<i>Primary School</i>	1	3.3181
	<i>Day-care/Crèche</i>	3	1.3062
<i>Institution</i>	<i>Community Facility</i>	3	1.3184
	<i>Community Facility/Clinic</i>	1	1.2996
<i>Place of Worship</i>	<i>Church</i>	4	1.982
<i>Municipal Uses</i>	<i>Municipal Uses</i>	2	1.9783
<i>Public Parks</i>	<i>Open Spaces</i>	28	9.6743
<i>Rivers or Riverbeds</i>	<i>Conservation Area</i>	6	29.7495
<i>Sports Fields and Related Infrastructure</i>	<i>Sports Fields</i>	1	1.5884
<i>Minor Roads</i>	<i>Minor Roads</i>		5.4667
<i>Public Streets</i>	<i>Public Streets</i>		43.5819
TOTAL		2213	200.4774

Part B Natural Environment

Section B1 Locality

The proposed residential development of Postmasburg is located in the Tsantsabane Local Municipality, in the Northern Cape approximately 175km East of Upington and 173km West-North-West of Kimberley. The area comprises of four land portions namely; Greenfields (200ha), Postdene 1 and 2 (26ha), Newtown-Marateng (63ha) and Mountain View (Koppies-Riemvasmaak (140ha) and Boichoko (68)).

The existing informal settlements that have been identified for relocation are spread throughout Postmasburg, as indicated in the following aerial photo:



Some of these families will be moved to the portion of the Project that is to be formalized, while the majority of the families, will be relocated to the 'Greenfields' portion of the Project.

The portion identified for formalization, is indicated in the following aerial photo:



The area identified for the 'Greenfields' portion of the Project is indicated in the following photo:



Section B2 Topography and Climate

The Postmasburg area is generally flat. The Langberg and Koranberg naturally divide the TLM jurisdiction area in a western and eastern area. The Asbesberg is nearly on the eastern side of the Municipal area. On the western side of the Langberg the ground falls in a western direction and the natural drainage is towards the Orange River.

The mean annual temperature for the majority of the TLM ranges between 18 and 20°C, towards the eastern side between 16 and 18°C and towards the western side between 20 and 22°C.

The mean annual rainfall for the area ranges between 100 and 400mm, the rainfall increases from the western side to the eastern side.

Section B3 Geological and Geotechnical Aspects

VGI Consult was appointed to conduct Geotechnical Site Investigations (GFSH-2 Phase 1 Report) and Dolomitic Stability Investigations on 26 February 2016 and 30 September 2016, respectively.

The GFSH-2 Phase 1 Report has been completed and was submitted to the Department of Geoscience where after a letter was issued stating that the Department is in support of the report.

The GFSH-2 Phase 2 work to commence during installation of services. This is to include service trench inspections and testing. A final stand listing is to be prepared, as well as a dolomite risk management plan

The summary of the geotechnical aspects is that the entire project area is underlain by dolomite land.

Section B4 Environmental Aspects

A "Preliminary Environmental Assessment of Informal Settlement Areas in Postmasburg" was prepared by Marguerite Cronje Environmental Assessment Practitioners in April 2016.

Part C Electrical Supply

Section C1 Supply Authority

The proposed development area falls within the Tsantsabane Local Municipality. The electrical supply authority for the area is both Eskom and TLM. Each supply authority supplies different areas in Postmasburg.

Section C2 Bulk Supply

The existing electrical network of the TLM is supplied by Eskom at two main infeed substations, namely the Hillside Substation and the Traction Substation.

Table C2.1 – Existing Bulk Supply

Substation	Hillside	Traction
Voltage	22/11kV	132/11kV
Transformers	2 X 5MVA	1 X 10MVA
Notified Maximum Demand	7.2MVA	5.6MVA
Peak Demand	4.62MVA	4.84MVA
Supply Arrangement	2 X 22kV Hare lines	1 X 132kV Hare line

From the above mentioned two infeed substations, the existing electrical infrastructure distributes the supply by means of an 11kV network. This 11kV network is made up of both overhead and underground systems.

The existing 11kV infrastructure is very old and due to the lack of regular maintenance, much of the infrastructure is in desperate need of repair or replacement.

Section C3 Miniature Substations / Transformers

The older portion of the network does not have miniature substations, but instead consist of MV yards with floor standing outdoor transformer(s) and switchgear. These old transformers have various problems that need immediate attention, including oil leaks, broken bushings, un-insulated MV terminations, etc.

There is also a lack of metering on these older transformer installations, which makes load balancing and determination of spare capacity essentially impossible.

Section C4 LV Network

LV distribution is done by both overhead and underground networks. The majority of the existing network is old and due to lack of regular maintenance is in a very poor condition. Due to the poor condition of the infrastructure, there are numerous areas where the infrastructure poses a serious threat to the public safety.

Section C5 As-built Information

The as-built information of the existing electrical reticulation has recently been updated by Heyns van Rooyen Consulting Electrical Engineer as part of the masterplan report. This report also highlighted the condition of the infrastructure as well as what repairs/replacement of the infrastructure is needed.

Section C6 Electrical Demands

The electrical designs of the internal electrical infrastructure will provide an adequately matched connection to each individual registered stand in accordance to its designated use and economic level of residents catered for.

The following received information was used to determine the electrical connection requirements;

- Fully Subsidized Units – A.D.M.D. of 2.5kVA per unit. These units will receive a 20A single phase supply.
- Bonded Units – A.D.M.D. of 3.5kVA per unit. These units will receive a 40A single phase supply.
- Walk-up Units – A.D.M.D. of 2.5kVA per unit. These units will receive a 60A single phase supply.

The table below indicates the estimated peak load for the development.

Table C6.1 – Mountain View Demand Forecast

Zoning	Land Use	No of Stands	Extent (ha)	Assumed FSR / Density	ADMD	ADMD kVA/m ² (INDUSTRIAL /BUSINESS)	TOTAL DEMAND
<i>Subsidised Housing</i>	<i>Residential (350m² Erven)</i>	2600	102.57		3.5		9100
<i>Business Premises</i>	<i>Business</i>	6	3.04	0.6		0.08	1459.2
<i>Special Zone</i>	<i>Bus Stop/Taxi Rank</i>	3	1.39	0.3		0.03	125.1
<i>Place of Instruction</i>	<i>Primary/Secondary School</i>	2	6.02	0.2		0.02	240.8
	<i>Primary School</i>	1	3.66	0.2		0.02	146.4
	<i>Day-care/Crèche</i>	2	0.977	0.2		0.04	78.16
<i>Place of Worship</i>	<i>Church</i>	3	0.776	0.2		0.02	31.04

Zoning	Land Use	No of Stands	Extent (ha)	Assumed FSR / Density	ADMD	ADMD kVA/m ² (INDUSTRIAL /BUSINESS)	TOTAL DEMAND
Institution	Community Facility	4	2.0645	0.6		0.08	990.96
	Clinic	2	0.97	0.6		0.08	465.6
Municipal Uses	Municipal	4	1.64	0.5		0.02	164
Public Parks	Open Spaces	22	24.567				0
Sports Fields and Related Infrastructure	Sports Field and related infrastructure	2	3.8114	0.2		0.02	152.456
Public Street	Streets		40.0716				47.95
Minor Roads	30m road		6.1511				10.68
TOTAL		2651	197.71				13 012kVA

Table C6.2 – Greenfields Demand Forecast

Zoning	Land Use	No of Stands	Extent (ha)	Assumed FSR / Density	ADMD	ADMD kVA/m ² (INDUSTRIAL /BUSINESS)	TOTAL DEMAND
Subsidised Housing	Residential	2158	86.5		3.5		7553
Business	Business	2	2.0129	0.6		0.08	966.192
Special Zone	Bus Stop/Taxi Rank	2	1.1682	0.3		0.03	105.138
Place of Instruction	Secondary School	1	3.9512	0.2		0.02	158.048
	Primary/Secondary School	1	5.5817	0.2		0.02	223.268
	Primary School	1	3.3181	0.2		0.02	132.724
	Day-care/Crèche	3	1.3062	0.2		0.04	104.496
Institution	Community Facility	3	1.3184	0.6		0.08	632.832
	Community Facility/Clinic	1	1.2996	0.6		0.08	623.808
Place of Worship	Church	4	1.982	0.2		0.02	79.28
Municipal Uses	Municipal Uses	2	1.9783	0.5		0.02	197.83
Public Parks	Open Spaces	28	9.6743				0
Rivers or Riverbeds	Conservation Area	6	29.7495				0
Sports Fields and Related Infrastructure	Sports Fields	1	1.5884	0.2		0.02	63.536
Minor Roads	Minor Roads		5.4667				6.54
Public Streets	Public Streets		43.5819				75.66
TOTAL		2213	200.48				10 922kVA

Table C6.3– Existing Townships Demand Forecast

Zoning	Land Use	No of Stands	Extent (ha)	Assumed FSR / Density	ADMD	TOTAL DEMAND
<i>Postdene 1 and 2</i>	<i>Residential</i>	1140	26	N/A	3.5	3990
<i>Newtown</i>	<i>Residential</i>	990	63	N/A	3.5	3465
TOTAL		2130	89			7 455kVA

The total estimated maximum demand for the proposed development is **31.4 MVA** distributed as shown in the Tables above.

Section C7 Spare Capacity Availability

Due to the large amount of capacity required for the proposed development, the existing infrastructure will not have enough spare capacity to supply the proposed development.

After a basic calculation of the extent of the bulk capacity required for the Project, Eskom was approached to determine their ability to supply the bulk electricity for the Project. They initially indicated that they will not be able to supply the required bulk, but have subsequently amended their comments to indicate that they will be able to supply the bulk once upgrades currently underway on the transmission network in the area have been completed.

Eskom has indicated that they are planning to construct a new 132kV/11kV substation, namely Boichoko Substation, to strengthen the supply networks in the Postmasburg area. This substation will be energized from the 132/22kV Vaalbos Substation by means of a new 132kV overhead line that is to be constructed. The MV network for the proposed development will be fed from the new substation.

TLM will take over and maintain the network to be installed in the development

Section C8 Proposed Bulk Supply

The scope of the project will entail a new bulk electricity supply by Eskom to TLM, by means of a new substation. From here a new internal electrical reticulation, inclusive of service connections and street lighting, will be installed. The internal networks will be taken over by TLM for maintenance and billing purposes.

Section C9 Proposed Design Methodology

MV Network

The MV network will be an 11kV overhead network feeding a configuration of pole-mounted transformers, of rating 11kV / 420V and Ring Main Units (RMU's) for larger stands. These units will be installed at optimum positions within the development.

Internal Reticulation

The internal electricity network will be designed to the norms, standards and requirements as laid down by TLM as the internal network will be handed over to them on completion.

It was observed from nearby networks that the LV networks consists of low voltage, 4-core, Aerial Bundled Conductors (ABC) with a separate 25mm² streetlight-core, supplied from pole-mounted transformers. These ABC conductors are connected to pole-mounted distributions boxes which connects a 10mm², 3-core, AIRDAC conductor with communication core to the house.

The above standard will be communicated to TLM before being adopted to the project.

Section C10 Proposed Energy Efficiency Measures

The ADMD of the development can be reduced by 40 - 60% with incorporation of the following energy saving measures in the development;

- Use of Heat pumps and/or Solar panels for water heating,
- Cooking with gas,
- Fuel Cell Technology,
- LED Street lighting.

The average energy consumption by each household can also be reduced especially in winter time if the units are designed in such a way that the architects takes into consideration the following points that will allow natural heating of the households;

- Passive Temperature Measures by designing the units to face in the North direction,
- Insulation of the Roofing space
- Double glazing of the windows.

Section C11 Standard Details

The relevant updated standards that shall be used for the project are listed in the table below:

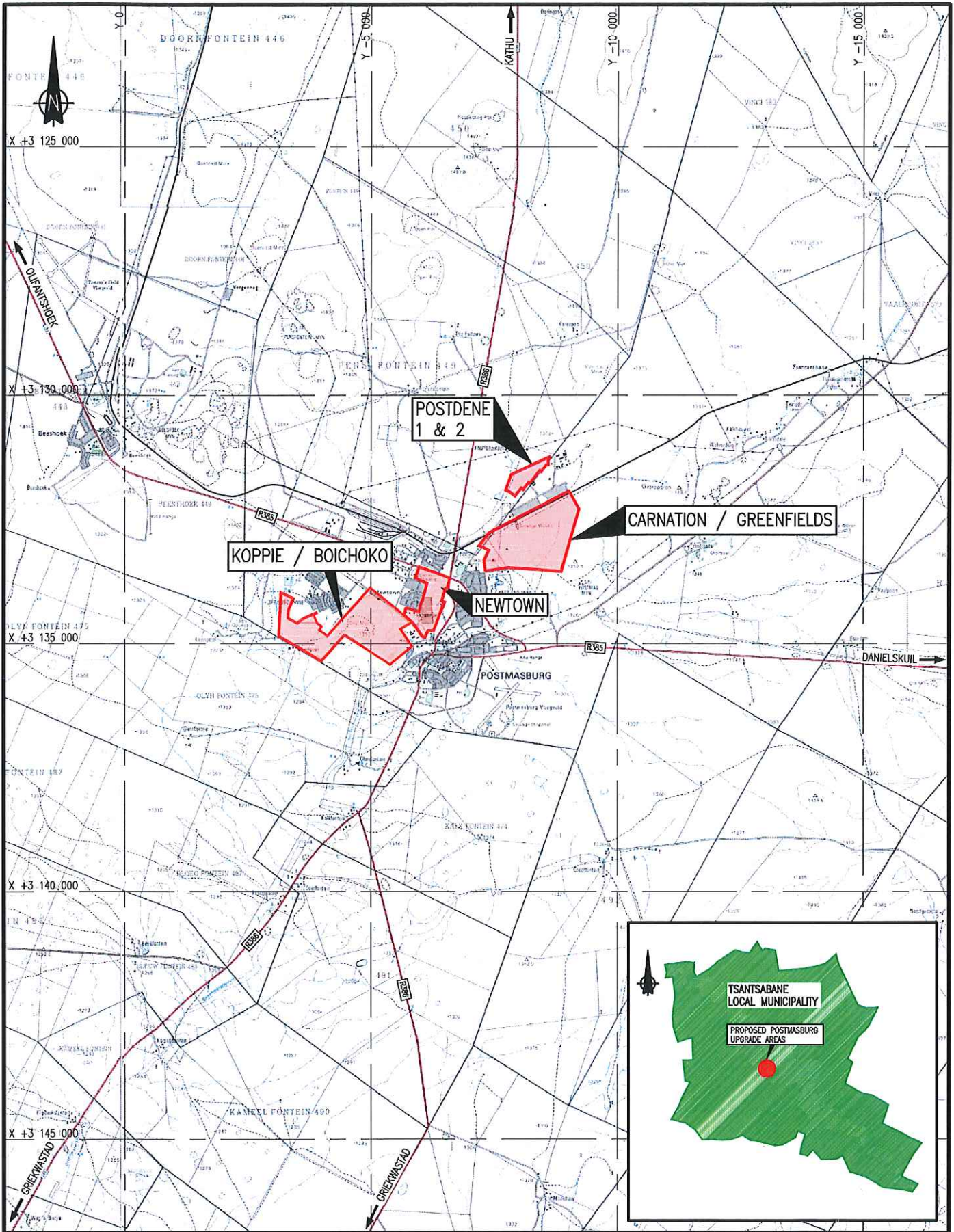
DGL 34-619, Distribution Standard – Part 1: Network planning guideline for lines and cables.
DSP 34-1080 (DSP 0003), Distribution Standard – Part 4: Specification for earth fault indicators used for MV cable network
DSP 34-1622, Distribution Standard – Part 22: Accessories for medium-voltage power cables with rated voltages from 11 kV to 33 kV.
DSP 34-1658 (DISSCAAP9), Distribution Standard – Part 4: Corrosion protection specification for distribution outdoor equipment manufactured from steel.

DSP 34-253, Distribution Standard Part 15: Distribution specification for electrical terminal blocks.
DSP 34-462, Distribution Standard Part 15: Standard design for distribution protection schemes.
DST 34-06, Distribution Standard – Part 22: Medium voltage services to large power users.
DST 34-1175, Distribution Standard – Part 22: Cables Section 0: General information and requirements for medium voltage cable systems.
DST 34-1175: General information and requirements for MV cable systems
DST 34-1176: General information and requirements for LV cable systems
DST 34-542, Distribution Standard – Part 1: Planning: Distribution voltage regulation and apportionment limits.
IEC 60287-1-1, Electric cables - Calculation of the current rating, Part 1-1: Current rating equations (100 % load factor) and calculation of losses – General.
IEC 60853-1, Calculation of the cyclic and emergency current rating of cables. Part 1: Cyclic rating factor for cables up to and including 18/30 (36) kV.
IEC 60853-2, Calculation of the cyclic and emergency current rating of cables, Part 2: Cyclic rating of cables greater than 18/30 (36) kV and emergency ratings for cables of all voltages.
NRS 012 / SANS 876, Cable terminations and live conductors within air-filled enclosures (insulation coordination) for rated a.c. voltages from 7.2 kV and up to and including 36 kV.
NRS 012, Cable terminations and live conductors within air-filled enclosures (insulation coordination) for rated a.c. voltages from 7.2 kV and up to and including 36 kV.
NRS 053: Edition 2, Accessories for medium-voltage power cables (3.8/6.6 kV to 19/33 kV).
SANS 10142, The Wiring of Premises - LV Installations
SANS 1019, Standard voltages, currents and insulation levels for electricity supply.
SANS 121 / ISO 1461, Hot-dip galvanized coatings on fabricated iron and steel articles – Specifications and test methods.
SANS 1339, Electric cables – Cross-linked polyethylene (XLPE)-insulated cables for voltages from 3.8/6.6 kV up to 19/33 kV.
SANS 60529, Degrees of protection provided by enclosures (IP Code).

Applicable Standards



ANNEXURE A1



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BIGEN AFRICA Services (PTY) LTD
 Allan Cormack Street
 The Innovation Hub Persequer Pretoria
 PO Box 29 The Innovation Hub Pretoria 0087
 Tel: +27 (0) 12 842 8700
 Fax: +27 (0) 12 843 9000/9001
 E-mail: pretoria@bigenafrica.com
 www.bigenafrica.com



PROJECT:
POSTMASBURG INFRASTRUCTURE UPGRADE AREA

DWG TITLE:
LOCALITY PLAN

DRAWN:
 S.L. Pitse

CHECKED:
 D.O. Storbeck

APPROVED:
 D.O. Storbeck

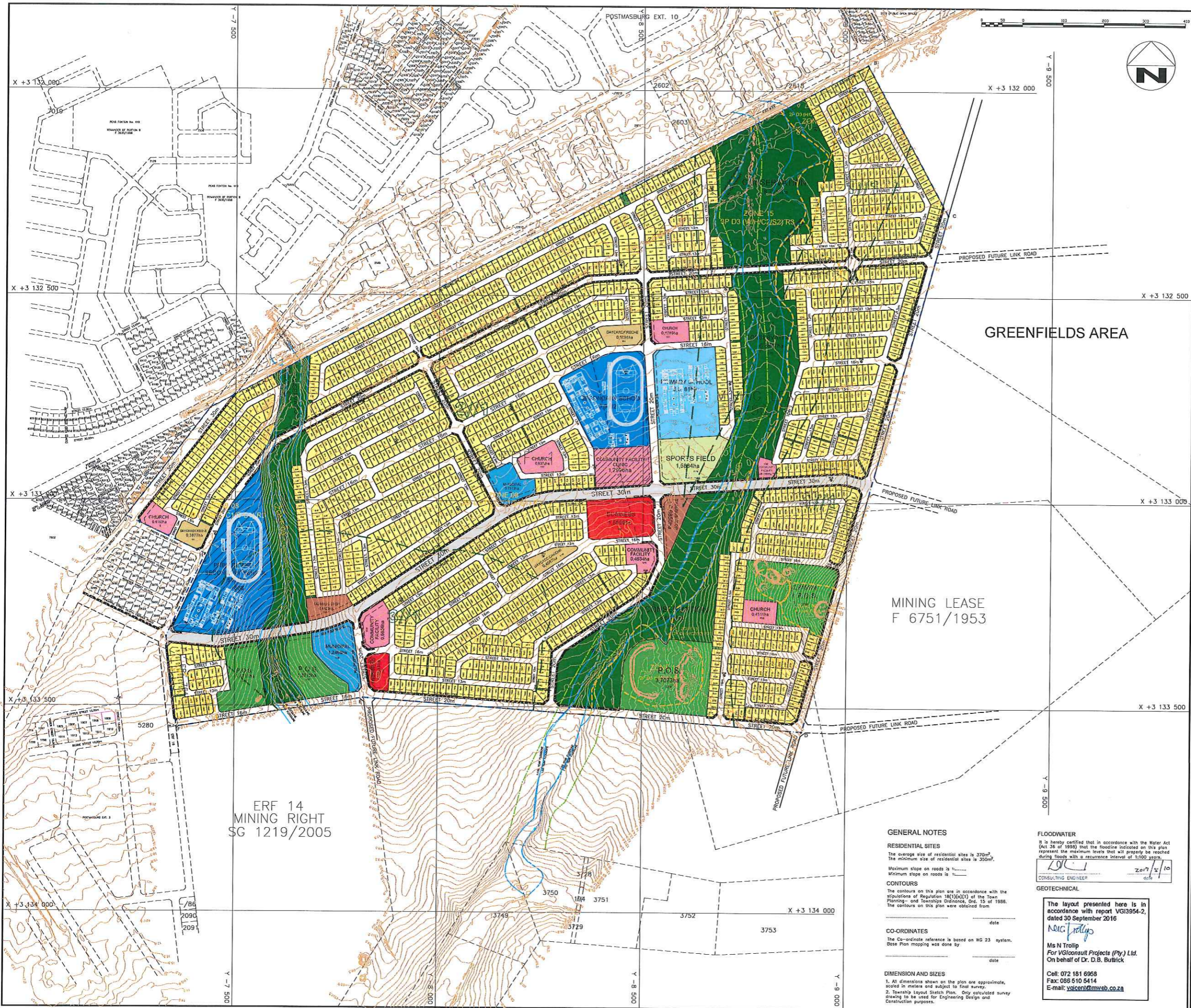
SCALE:
 1:100 000

DATE:
 May 2017

DWG No:
2296.00.ZA.01.S001

VER:
A.0

ANNEXURE A2



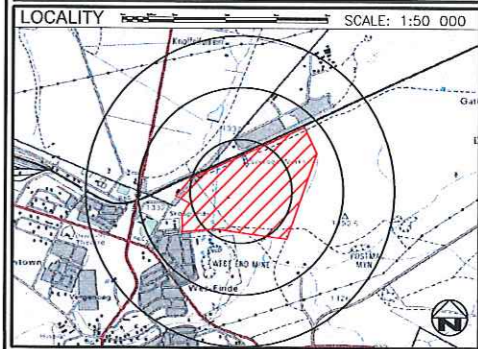
GREENFIELDS AREA

**MINING LEASE
F 6751/1953**

**ERF 14
MINING RIGHT
SG 1219/2005**

PROJECT

PROPOSED TOWNSHIP
POSTMASBURG_GREENFIELDS
 SITUATED ON PART OF THE REMAINDER OF ERF 761 POSTMASBURG.
 LOCAL AUTHORITY : TSANTSABANE LOCAL MUNICIPALITY
 DISTRICT : ZF MCGAWU
 GEODETICAL SYSTEM : WG 23



LAND USE TABLE

ZONING	LAND USE	ERF NUMBERS	NO. OF STANDS	AREA OF STANDS/STREETS	% OF AREA
SUBSIDISED HOUSING	RESIDENTIAL (350m ² ERFVEN)	11-2301-230100-110001-1101-1102-1103-1104-1105-1106-1107-1108-1109-1110-1111-1112-1113-1114-1115-1116-1117-1118-1119-1120-230101-230102-230103-230104-230105-230106-230107-230108-230109-230110-230111-230112-230113-230114-230115-230116-230117-230118-230119-230120-230121-230122-230123-230124-230125-230126-230127-230128-230129-230130-230131-230132-230133-230134-230135-230136-230137-230138-230139-230140-230141-230142-230143-230144-230145-230146-230147-230148-230149-230150-230151-230152-230153-230154-230155-230156-230157-230158-230159-230160-230161-230162-230163-230164-230165-230166-230167-230168-230169-230170-230171-230172-230173-230174-230175-230176-230177-230178-230179-230180-230181-230182-230183-230184-230185-230186-230187-230188-230189-230190-230191-230192-230193-230194-230195-230196-230197-230198-230199-230200	2158	86,5072	43,15
BUSINESS PREMISES	BUSINESS	0431010	2	2,0128	1,00
SPECIAL ZONE	BUS STOP/TAXI RANK	202218	2	1,1682	0,58
PLACE OF INSTRUCTION	SECONDARY SCHOOL	378	1	3,0512	1,97
	PRIMARY SCHOOL	308	1	5,5817	2,78
INSTITUTION	DAYCARE / CRECHE	1010	1	3,3181	1,66
	DAYCARE / CRECHE	21851748	3	1,3062	0,65
PLACE OF WORSHIP	COMMUNITY FACILITY	134213981915	3	1,3184	0,65
	CHURCH	477	1	1,2996	0,65
MUNICIPAL USES	MUNICIPAL UTILS	1100010212002	4	1,9820	0,99
PUBLIC PARKS	OPEN SPACES	1961568	2	1,9783	0,99
RIVERS OR RIVERBEDS	SPORT FIELDS	2186-2213	28	9,6743	4,83
SPORT FIELDS AND RELATED INFRASTRUCTURE	SPORT FIELDS	2180-2185	6	29,7455	14,84
	MINOR ROADS	2179	1	1,5884	0,79
PUBLIC STREETS	PUBLIC STREETS			5,4667	2,73
TOTAL			2213	200,4848	100%

GENERAL NOTES


THE FIGURE ABCDEFHIA REPRESENTS OUTSIDE BOUNDARY OF THE PROPOSED TOWNSHIP POSTMASBURG_GREENFIELDS BEING APPROXIMATELY 200,4848ha IN EXTENT.

- OUTSIDE BOUNDARY OF TOWNSHIP
- GEOTECHNICAL ZONES
- SOILS ZONES
- ENVIRONMENTAL ZONE
- 1:50 YEARS FLOODLINE
- 1:100 YEARS FLOODLINE
- LINE OF NO ACCESS
- FARM PORTIONS
- 32m FLOODLINE BUFFER
- TEST PIS

REVISIONS

	D: DRAFT	C: CIRCULATED	A: APPROVED
D1.	1:50 AND 1:100 YEAR FLOODLINE ADDED.		C. MASON 2017.01.24
D2.	RE-LAYOUT.		C. MASON 2017.02.24
D3.	AMEND INTERSECTIONS.		C. MASON 2017.03.01
D4.	AMEND LAND USE TABLE.		C. MASON 2017.03.06
D5.	AMEND LAYOUT TO ADD STORWATER AND AMEND LAND USE TABLE.		C. MASON 2017.04.10
D6.	ERF NUMBERS ADDED.		C. MASON 2017.05.02
D7.	P.O.S. STRIPS ADDED FOR STORWATER.		C. MASON 2017.05.15

CLIENT:



TSANTSABANE LOCAL MUNICIPALITY

TOWN PLANNERS: Renier Meintjes
 SCALE: 1:3 000
 DRAWING REF: PosMas_Greenfields D7/2017.05.24
 DRAWING STATUS: DRAFT

GENERAL NOTES

RESIDENTIAL SITES
 The average size of residential sites is 370m². The minimum size of residential sites is 350m².
 Maximum slope on roads is 1:100
 Minimum slope on roads is 1:200

CONTOURS
 The contours on this plan are in accordance with the stipulations of Regulation 18(1)(a)(1) of the Town Planning and Townships Ordinance, Ord. 15 of 1986. The contours on this plan were obtained from _____ date _____

CO-ORDINATES
 The Co-ordinate reference is based on WGS 84 system. Base Plan mapping was done by _____ date _____

DIMENSION AND SIZES
 1. All dimensions shown on the plan are approximate, scaled in meters and subject to final survey.
 2. Township Layout Sketch Plan. Only calculated survey drawing to be used for Engineering Design and Construction purposes.

FLOODWATER
 It is hereby certified that in accordance with the Water Act (Act 36 of 1956) that the floodlines indicated on this plan represent the maximum levels that will properly be reached during floods with a recurrence interval of 1:100 years.



CONSULTING ENGINEER

GEOTECHNICAL
 The layout presented here is in accordance with report VGI3954-2, dated 30 September 2016



Ms N Trollip
 For VGIconsult Projects (Pty) Ltd.
 On behalf of Dr. D.B. Butrick

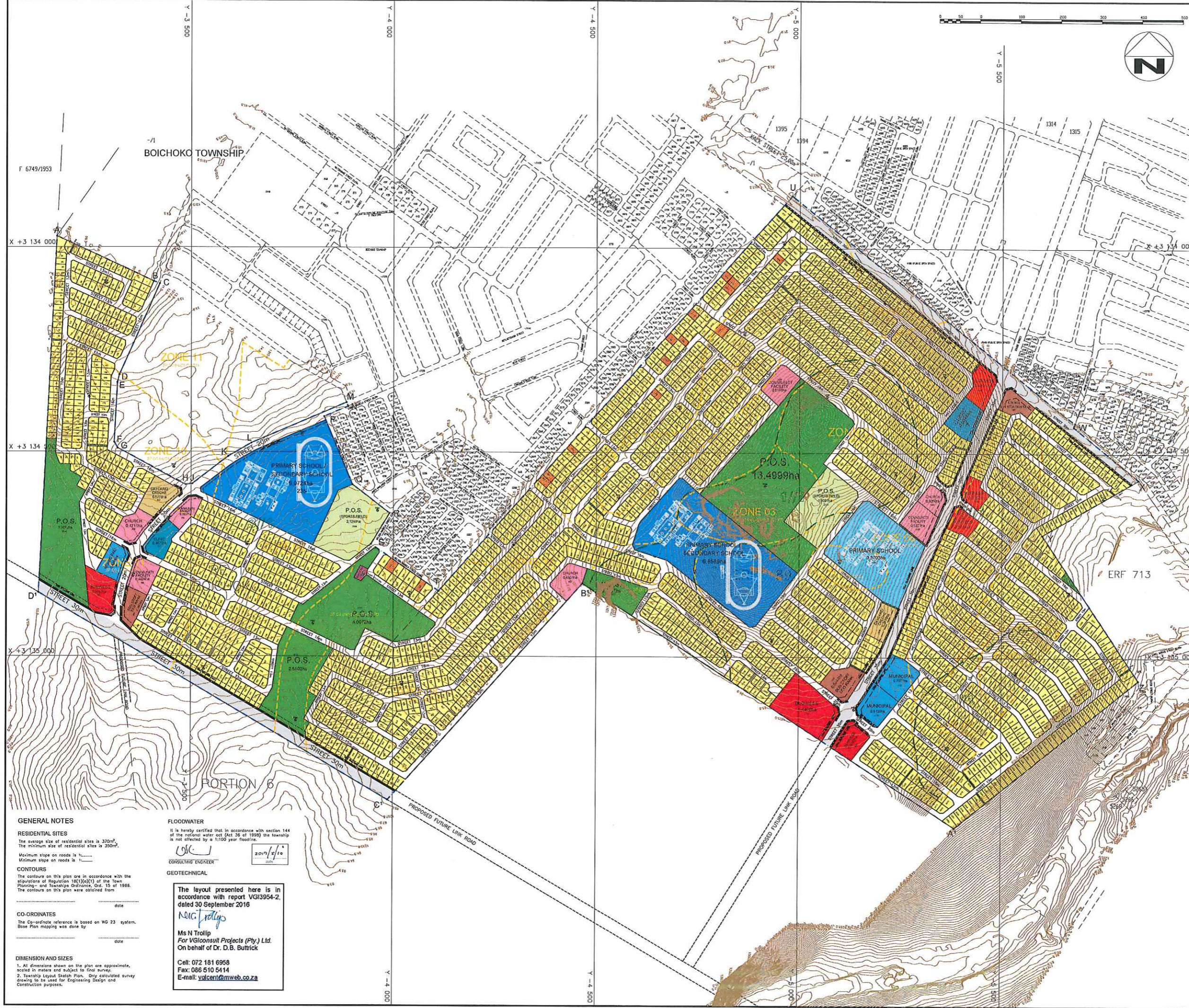
Call: 072 181 6958
 Fax: 086 610 5414
 E-mail: voicent@mweb.co.za

URBAN DYNAMICS

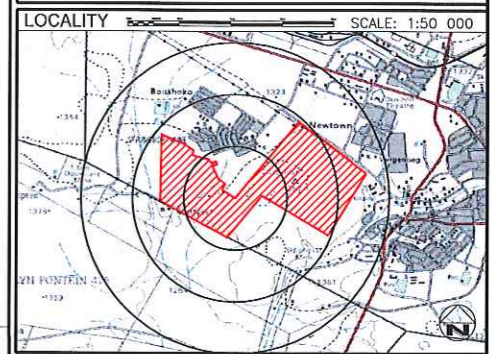


37 CUPRE ROAD
 PARKTOWN
 P.O. BOX 291803
 MELVILLE
 2109

FAX: (+27 11) 482-9959
 E-MAIL: renier@urbandynamics.co.za



PROJECT
 PROPOSED TOWNSHIP
MOUNTAIN VIEW
 SITUATED ON PART OF THE REMAINDER OF ERF 1 BOICHOKE, PART OF THE REMAINDER OF ERF 1 AND PART ERF 89, POSTMASBURG.
 LOCAL AUTHORITY : TSANTSABANE LOCAL MUNICIPALITY
 DISTRICT : ZF MGCAWU
 GEODETICAL SYSTEM : WG 23



LAND USE TABLE

ZONING	LAND USE	ERF NUMBERS	No. OF STANDS	AREA OF STANDS & STREETS	% OF AREA
SUBSIDISED HOUSING	RESIDENTIAL (350m ² ERVEN)	1442-22224-22225-22226-22227-22228-22229-22230-22231-22232-22233-22234-22235-22236-22237-22238-22239-22240-22241-22242-22243-22244-22245-22246-22247-22248-22249-22250-22251-22252-22253-22254-22255-22256-22257-22258-22259-22260	2600	102,5798	61,88
BUSINESS PREMISES	OFFICES	251125,126,127,128,129,130,131,132,133,134,135,136,137,138,139,140,141,142,143,144,145,146,147,148,149,150,151,152,153,154,155,156,157,158,159,160,161,162,163,164,165,166,167,168,169,170,171,172,173,174,175,176,177,178,179,180,181,182,183,184,185,186,187,188,189,190,191,192,193,194,195,196,197,198,199,200	6	3,0404	1,54
SPECIAL ZONE	BUS STOP/TAXI RANK	201,432,1561	3	1,3800	0,70
PLACE OF INSTRUCTION	PRIMARY SCHOOL	223,1033	2	6,0274	3,05
	DAYCARE / CRECHE	143	1	3,6637	1,85
PLACE OF WORSHIP	CHURCH	223,1419	2	0,9773	0,49
	CHURCH	223,821,1423	3	0,7767	0,39
INSTITUTION	COMMUNITY FACILITY	223,263,223,1434	4	2,0648	1,04
MUNICIPAL USES	SCHOOLS	223,1589	2	0,9719	0,49
	MUNICIPAL	24003,219,3193	4	1,6483	0,83
PUBLIC PARKS	GREEN SPACES	2503-2504	22	24,5676	12,42
	SPORT FIELDS AND RELATED INFRASTRUCTURE	2143,2428	2	3,8114	1,93
PUBLIC STREETS	STREETS			40,0716	20,28
	MINOR ROADS	30m ROAD			6,1511
TOTAL			2651	197,7417	100%

GENERAL NOTES
 THE FIGURE ABCDEFGHIJKLMNOPQRSTUVWXYZA REPRESENTS OUTSIDE BOUNDARY OF THE PROPOSED TOWNSHIP MOUNTAIN VIEW, BEING APPROXIMATELY 197,7417ha IN EXTENT.

- OUTSIDE BOUNDARY OF TOWNSHIP
- - - GEOTECHNICAL ZONES
- SOILS ZONES
- 1:50 YEARS FLOODLINE
- 1:100 YEARS FLOODLINE
- LINE OF NO ACCESS
- FARM PORTIONS
- TEST PITS
- PERMANENT STRUCTURES

REVISIONS

REVISED BY	D: DRAFT	C: CIRCULATED	A: APPROVED
D1. LAYOUT AMENDED TO ACCOMMODATE TRAFFIC ENGINEER'S COMMENTS.			C. Moon 2017.02.08
D2. AMEND LAYOUT TO ACCOMMODATE STORMWATER AND UPDATE LAND USE TABLE.			C. Moon 2017.04.19
D3. ERF NUMBERS ADDED.			C. Moon 2017.05.04
D4. P.O.S. STRIPS ADDED FOR STORMWATER.			C. Moon 2017.05.15

GENERAL NOTES
RESIDENTIAL SITES
 The average size of residential sites is 370m². The minimum size of residential sites is 350m².
 Maximum slope on roads is 1:100.
 Minimum slope on roads is 1:100.
CONTOURS
 The contours on this plan are in accordance with the stipulations of Regulation 18(1)(c)(1) of the Town Planning and Township Act, 1982, and the Town Planning and Township Act, 1982, as amended.
CO-ORDINATES
 The Co-ordinate reference is based on WG 23 system. Base Plan mapping was done by...
DIMENSION AND SIZES
 1. All dimensions shown on the plan are approximate, scaled in meters and subject to final survey.
 2. Township Layout Sketch Plan. Only calculated survey drawings to be used for Engineering Design and Construction purposes.

FLOODWATER
 It is hereby certified that in accordance with section 144 of the national water act (Act 36 of 1998) the township is not affected by a 1:100 year flooding.
GEOTECHNICAL
 The layout presented here is in accordance with report VGI3954-2, dated 30 September 2016
 Ms N Trollip
 For VGIconsult Projects (Pty.) Ltd.
 On behalf of Dr. D.B. Butrick
 Cell: 072 181 6958
 Fax: 086 510 5414
 E-mail: volcent@vweb.co.za

CLIENT:
 TSANTSABANE LOCAL MUNICIPALITY

TOWN PLANNER: Renier Moutjies
SCALE: 1:3 000
DRAWING REF:
MountainView-Lay
D4/2017.05.25
DRAWING STATUS:
DRAFT

URBAN DYNAMICS
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POSTDENE 1 AND 2 AREA

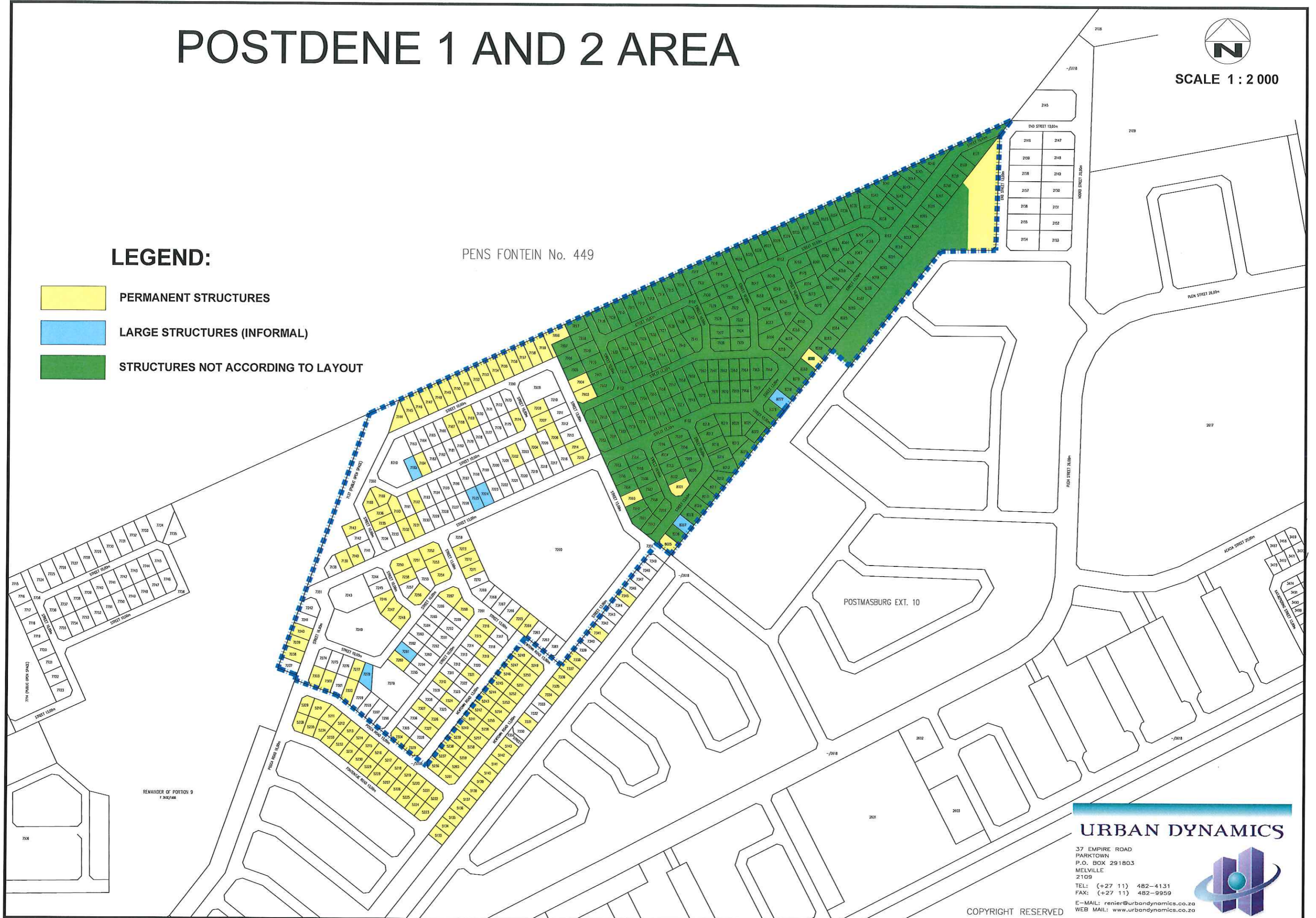


SCALE 1 : 2 000

LEGEND:

- PERMANENT STRUCTURES
- LARGE STRUCTURES (INFORMAL)
- STRUCTURES NOT ACCORDING TO LAYOUT

PENS FONTEIN No. 449



URBAN DYNAMICS

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 E-MAIL: renier@urbandynamics.co.za
 WEB MAIL: www.urbandynamics.co.za

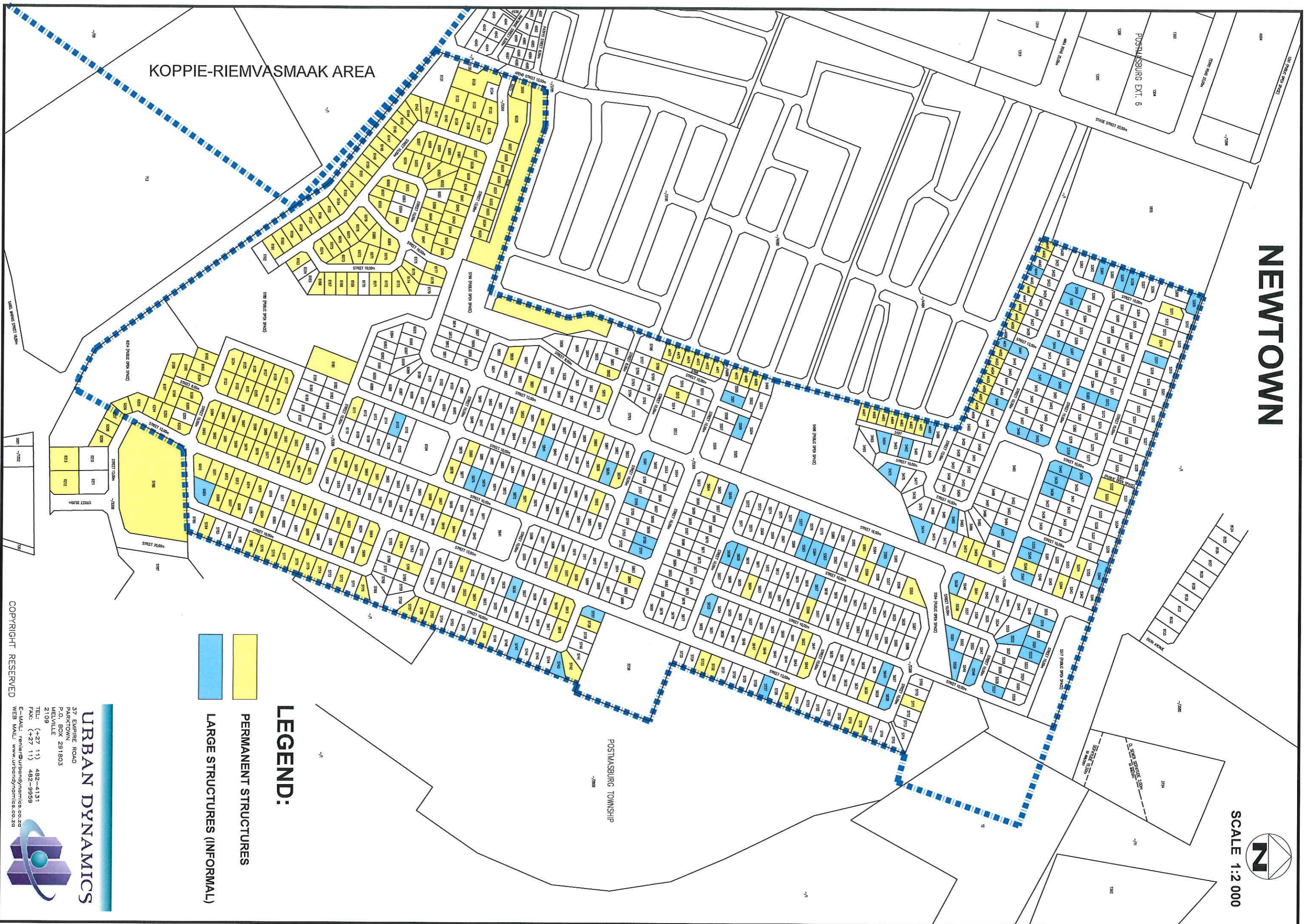


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NEWTOWN



SCALE 1:2 000



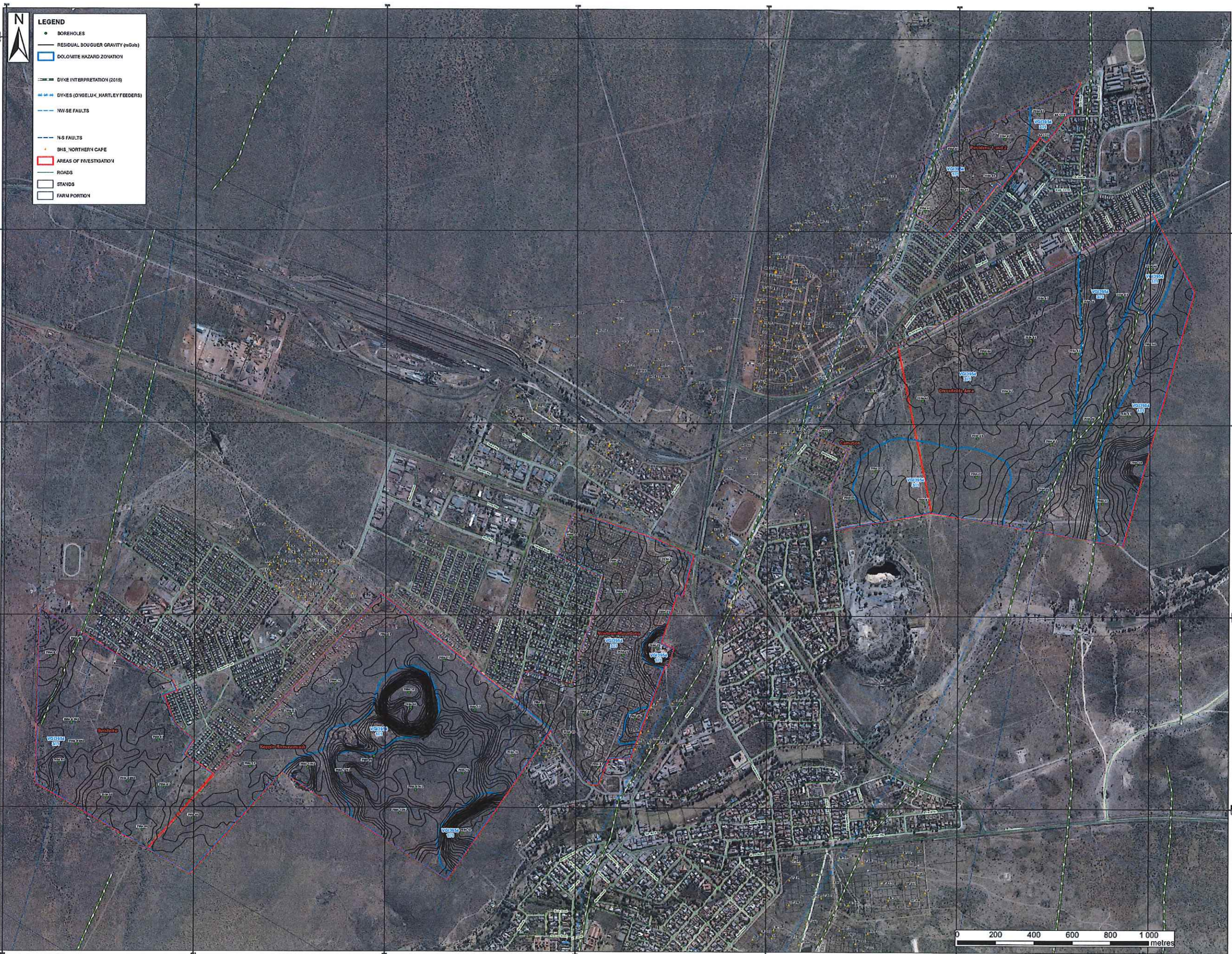
LEGEND:

- PERMANENT STRUCTURES (Yellow box)
- LARGE STRUCTURES (INFORMAL) (Blue box)

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ANNEXURE B1



LEGEND

- BOREHOLES
- RESIDUAL BOUGUER GRAVITY (mGal)
- DOLOMITE HAZARD ZONATION
- DYKE INTERPRETATION (2016)
- DYKES (QVSELUK, HARTLEY FEEDERS)
- NW-SE FAULTS
- NS FAULTS
- BHS, NORTHERN CAPE
- AREAS OF INVESTIGATION
- ROADS
- STANDS
- FARM PORTION

No.	DATE	AMENDMENT	D.P.W.

co-ordinate system
 Transverse Mercator
 Central Meridian = 23°
 False Easting = 0°
 False Northing = 0°
 Scale Factor = 1
 Datum = WGS 84

as-built drawings
 certified as-built drawings as per Centralised Drawing
 Archive AS-BUILT DRAWING REQUIREMENTS
 name: _____
 date: _____
 professional registration no.: _____

cad file name _____ page type
 A 0

consultant
VGIconsult
 2 MULBERRY HILL
 OFFICE PARK
 BROADACRES DRIVE
 DAINFERN VALLEY
 PO BOX 604
 FOURWAYS
 2055
 TEL: (011) 469 0854
 FAX: (011) 469 0961
 E-mail: vgjhb@mweb.co.za

discipline **GEOTECHNICAL**
 service
 VGI3954-2:
 PROPOSED POSTMASBURG
 HOUSING PROJECT: FEASIBILITY-STAGE
 DOLOMITE STABILITY INVESTIGATION

Project Number **VGI3954**

drawing title
**TEST PITS, RESIDUAL GRAVITY AND
 DOLOMITE HAZARD ZONATION**

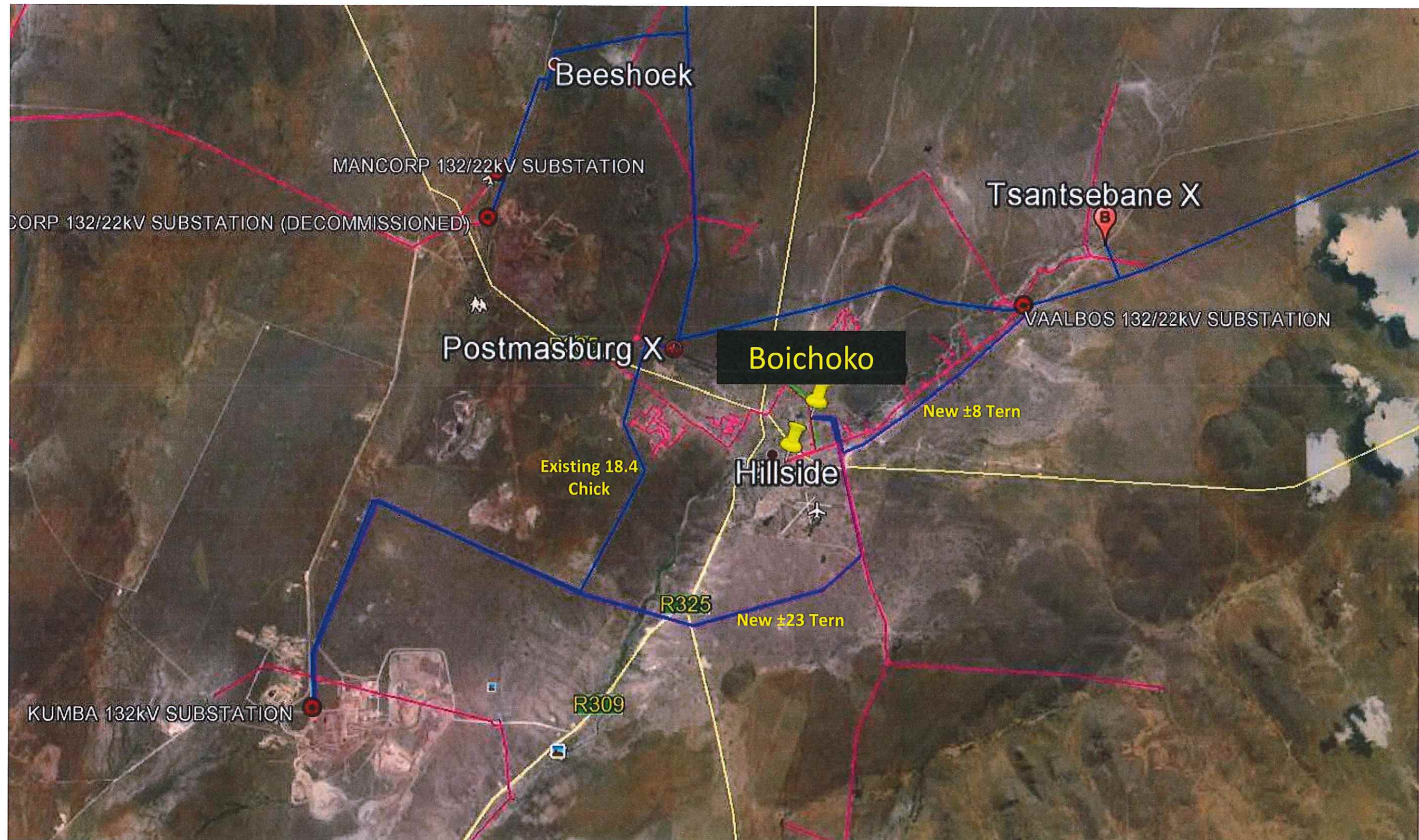
ref.no. VGI3954	designed N.T.
scale 1:6 500	drawn AR.G.
date APRIL 2016	checked N.T.

Drawing number
DRAWING VGI3954/01



ANNEXURE C1

New Boichoko sub & 132kV ring network proposal



New Boichoko sub site alternatives

