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REMAINDER OF THE FARM WEMMERSHUIS 379, REGISTRATION DIVISION J.T, PROVINCE MPUMALANGA AND REMAINDER OF THE FARM BERGENDAL 981, REGISTRATION DIVISION J.T, PROVINCE MPUMALANGA

THE SUPPLY OF CIVIL SERVICES FOR THE PLANNED BELFAST VILLAGE

TOWN PLANNER:

Korsman & Associates

ARCHITECT:

APIL & ASSOCIATES

REPORT COMPILED BY:

SCIP ENGINEERING GROUP

BBBEE: Level 2, 46% black female owned & 156% recognition level
ISO 9001:2008 Certified
NHBRC Registration: 1-181214979
A member of CESA

Van Vliet de Wet & Partners
In proud partnership with
SCIP Engineering

Associates: M Marijnen
MP Barbosa; FF Deysel;
AS Le Roux;

Directors: JD Booyens;
NM Mjodi; P Booyens;
NM Ndaba
Reg. No. 1996/15526/07
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1 EXECUTIVE SUMMARY

The proposed Township is located south of Belfast in Mpumalanga adjacent to the N4 highway.

Access to this development will be provided through the existing off-ramp and road network (R33) providing access to the existing Engen Garage and Wimpy.

Access Roads will be constructed in co-operation with other developers and design of these will accommodate existing township as well as future developments.

Internal Streets will be designed according to existing Design Standards and pavement designs will utilize in-situ materials as well as imported material from commercial sources.

Stormwater can be safely routed within the development on roads and within sub-surface systems. Existing stormwater infrastructure from higher lying areas will be accommodated through this development.

The provision of water will be gained from the reservoirs situated to the north of N4 highway. There is an existing servitude from the reservoirs containing a water line and sewer line to the Engen and there is adequate space to install the new water.

After liaising with the Emakhazeni Local Municipality it was made clear that sufficient bulk water is available for this development. A submersible pump will have to be installed in the main reservoir and a new pipe line will have to be installed from the reservoir site to the new development.

Sewage will be drained to a new package plant which will be situated to the east of the property.

The normal activities of people living in this future township will not lead to soil, surface water or ground water pollution.

Special measures will be taken in accommodating eco sensitive areas.

Strict Health and Safety Regulations will be enforced as per the Health and Safety Act and associated regulations during construction. All fauna and flora outside the perimeter of this development shall be protected and will not be damaged.

Special attention will be given to dust control during the construction stage as the site is situated adjacent to a national road.

2 GENERAL INFORMATION

2.1. Location

The township is located to the north of Belfast adjacent to the N4 highway.

Figure 1 indicates the border parameters of the property under discussion.

Figure 1

The existing Engen Garage and Wimpy is situated to the north-west of the property.

No flood line is applicable for this development.

2.2. Applicant

The Owner
Mlangeni Family Trust

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2.3. Consulting Engineer

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2.4. Layout plan

The layout plan that was used for the preparation of the Civil Services Report (this report) is shown in *Appendix A*.

2.5. Land-use rights

Application is made for the following land-use rights. A table with details is available from Townscape Planning Solutions.

ZONINGS:	TOTAL ERVEN	AREA Ha	MIN Area	MAX Area	AVE. Area	% OF TOWN
"RESIDENTIAL MEDIUM"	161	8,5008 Ha	500 m²	785 m²	528 m²	7.23
"RESIDENTIAL HIGH"	2	9,6774 Ha	46 463 m²	50 3[illegible] m²	48 357 m²	8.23
"AGRICULTURE"	6	52,2357 Ha	4 908 m²	174 985 m²	87 060 m²	44.43
"INSTITUTIONAL"	7	[illegible],4025 Ha	1 229 m²	3 282 m²	2 004 m²	1.19
"MIXED USE"	36	18,9075 Ha	300 m²	46 733 m²	5 252m²	16.08
"INUDSTRIAL"	9	2,3753 Ha	1 381 m²	4 [illegible]23 m²	2 639 m²	2.02
"OPEN SPACE"	6	11,4324 Ha	378 m²	87 345 m²	19 054 m²	9.72
"UTILITIES"	1	0,19[illegible]5 Ha	1 915 m²	1 915 m²	[illegible]915 m²	0.16
"PUBLIC ROAD"		12,8498 Ha				10.93
TOTAL:	226	117,5729 Ha				100 %

The total area of this development according to the details provided by Korsman & Associates is 117, 5729 hectares.

2.6. Services Agreement Proposed

It is the intention of the developer to hand the Civil Services of the township over to the Emakhazeni Local Municipality.

The ownership of all services will therefore revert to ELM after construction and the maintenance and insurance of the services will be the responsibility of ELM.

3 ASPECTS OF THE PROPOSED DEVELOPMENT REQUIRING SPECIAL ATTENTION

3.1. Water storage on site

There will be a need for a reservoir on site for potable and fire water requirements for a 3 day storage.

3.2. The Sewage treatment

A sewage package plant will be constructed for this development. All environmental regulations and any specifications regarding package plants will be adhered to.

4 ROADS

4.1 Access to the proposed Township and Traffic Impact Study

The proposed development will primarily have direct access from the N4 off-ramp (N33)

Figure 2

The Traffic Impact study by WSP should be studied for further details on the roads and road accesses.

4.2. Street classification

The following street classes were provided for and incorporated in the current layout by Townscape Planning Solutions.

Street Reserve Width	Class of road	Roadway width (m)	Road Description
10.5 m	Class 5	5.5m	Local Access Roads
16 m	Class 4	6 m	Local Collector Roads
25 m	Class 3	7.4 m	Distributors/Secondary Roads
30 m	Class 3	10 m	Distributors/Secondary Roads/ To industrial stands

Table 1

It is the opinion of *SCIP Engineering Group (Pty) Ltd.* that the various street widths provided are sufficient.

Services like stormwater, sewerage and water as well as Telecommunication and Electricity will also be accommodated in the road servitudes. These services will be accommodated according to the protocol set by ELM in terms of positioning in the servitudes.

4.3. Road Materials

The geotechnical report should be read with this section.

In-situ material as well as imported material will be utilized for construction of the layer works.

During the construction stage the Engineer will liaise with ELM in order to establish possible borrow pits.

5 STORMWATER

5.1 Surface Drainage

The road layout of the township leans itself to an adequate drainage system. Sufficient material slopes exists.

There is a watershed running through the site dividing the area in one small and one large area. The stormwater from the small area will be taken to the national road reserve and the stormwater from the remainder large area will be taken to a retention pond and be distributed to the agricultural holdings.

Stormwater, as surface runoff during rainfall events, can drain freely from erven via streets to kerb inlets that will be provided on all internal roads and spaced according to topography and therefore catchment size.

Stormwater lines are accommodated mostly in road reserves and these lines will be designed to also accommodate water run-off from higher lying adjacent townships.

It is not foreseen that any problems will be encountered to accommodate the 1:2 (residential) and 1:5 year (business) return period storms on the roads and in the sub-surface conduits.

Street levels will be designed in such a way that streets act as stormwater collectors. Stormwater inlets will be placed in such a way that access to stands are not compromised.

No erosion will take place since all streets will be paved.

5.2 Stormwater routing

The safe routing of stormwater within the Township will receive special attention.

A retention pond will be considered for this development and be distributed to the agricultural holdings. The requirement for a retention pond shall be in accordance with the bylaws of the Local Authority and shall be provided at detail design phase.

The EMP will be adhered to during the construction roads and stormwater infrastructure.

6 WATER SERVICES

6.1 Bulk water availability

This report does not aim to provide detail water demand modeling results or the exact impact of this development on the bulk water system, but rather aims to convey an engineering opinion on the ways and means to serve the development with water.

The impact of this development on the existing bulk water infrastructure will be quantified once the Design Engineer has been appointed for the detail design phase of both bulk and network water services.

Design drawings will be submitted with a design report by the Design Engineer to the Local Authority for their approval. It is the Local Authority's right to scrutinize the report and request changes to the design where needed.

The reservoirs which supplies Belfast is situated approximately 1.6km to the North of the proposed development.

After liaising with ELM the following information was made available:

- Capacity of reservoirs: 4ML/day
- Daily output currently: 3.5ML/day
- Available capacity for development: 0.5ML/day

There is an existing 50mm diameter water line in a registered servitude running from the reservoirs to the Engen Garage/ Wimpy. There is adequate space in the servitude to install a new line for the proposed development. *Figure 3* indicates the location of the reservoir site and the approximate position of the existing water line.

Figure 3

The proposed land use covered in the township layout of *Figure 1* will require an estimated water demand as follows:

Technical parameter	Estimated value
Estimated Total Daily Demand =	0.427 ML/day
Estimated Peak Flow Rate based on a peak factor of 8 =	39 L/s

It is therefore clear that the existing capacity will meet the demand of the proposed development.

A new pump line will be designed and installed in the existing servitude from the reservoir site to the new development. The water will be pumped from the main reservoirs by means of a submersible pump which will be installed in the reservoir. The approximate length of the new pipe line is 1.6km.

A new reservoir of approximately 1.3ML will be considered to be constructed on the property to ensure a 3 day supply for potable water and fire water.

The main water supply internally will be designed for fire water requirements and pipe sizes will likely vary from 75mm to 160mm diameter.

It was indicated by ELM that the intension is to construct a new reservoir site for the possible future High Altitude Training Centre. The reservoir site will be situated at a higher level and closer to the proposed development site which will enable ELM to connect the water supply to

the new reservoirs site. The current situation in terms of water is however adequate for the development.

6.2. Internal water layout

The township layout by Townscape Planning Solutions provides sufficient servitudes for an internal water network. The network will be designed and constructed according to municipal and national standards. All stands will be equipped with separate connections which will allow for internal fire systems as well.

Fire water will also be accommodated according to national and municipal standards.

7 SEWAGE SERVICES

7.1 Bulk Sewage Conveying availability

This report does not aim to provide detail sewage flow modeling results or the exact impact of this development on the existing bulk sewer system. The report merely aims to convey an engineering opinion regarding the ways and means of draining the development with a bulk and internal sewer systems.

Taking the contours and watershed into account, the internal water reticulation will be determined. Pump stations will be considered during the detailed design to pump sewage over the watershed to the proposed sewage package plant of adequate capacity.

Technical parameter	Estimated value
Estimated Average Daily Dry Weather Flow =	0.342 Ml/d
Estimated Peak Wet Weather Flow rate =	0.854 Ml/d

Internal sewer lines will likely vary from 160mm to 250mm diameter.

The new package plant with adequate capacity will be situated to the east and the treated water will be drained to ponds. The treated water will be distributed to the agricultural holdings.

The EMP and all standards/ laws regarding package plants will be strictly adhered to during the design and construction stage.

8 NETWORK SERVICES / DEVELOPMENT COST

8.1 Services

The costing of network services was based on the layout provided by *Townscape Planning Solutions* in November 2015.

The cost of network and bulk services is calculated separately.

INTERNAL SERVICES

Civil Service Discipline	Cost Estimate	Comments
Internal Services		
Water	R 7 550 000	
Sewer	R 8 687 500	
Roads & Stormwater	R 29 677 500	
SUB-TOTAL	**R 45 591 000**	
Plus 14% VAT	**R 6 428 100**	
TOTAL	**R 52 019 100**	

BULK SERVICES

Civil Service Discipline	Cost Estimate	Comments
Water	R 2 400 000	
Plus 14% VAT	**R 336 000**	
TOTAL	**R 2 736 000**	

9 BULK SERVICES CONTRIBUTION

9.1 Services

ELM has a Bulk Services Contribution system in place.

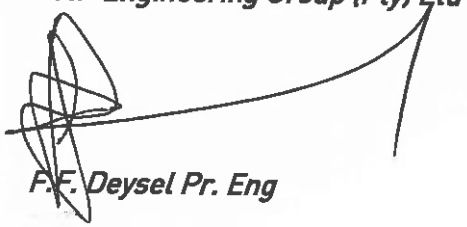
Hereby, developers will have to pay a bulk services contribution and in turn receive bulk services to the development's boundary provided by ELM.

10 RECOMMENDATION

Once the Township establishment process is underway, detail designs will follow and eventually an agreement for the delivery of services could be entered into by the developer and ELM.

Trust you find this in order.

Yours faithfully,
SCIP Engineering Group (Pty) Ltd



F.F. Deysel Pr. Eng

APPENDIX A
Township Layout