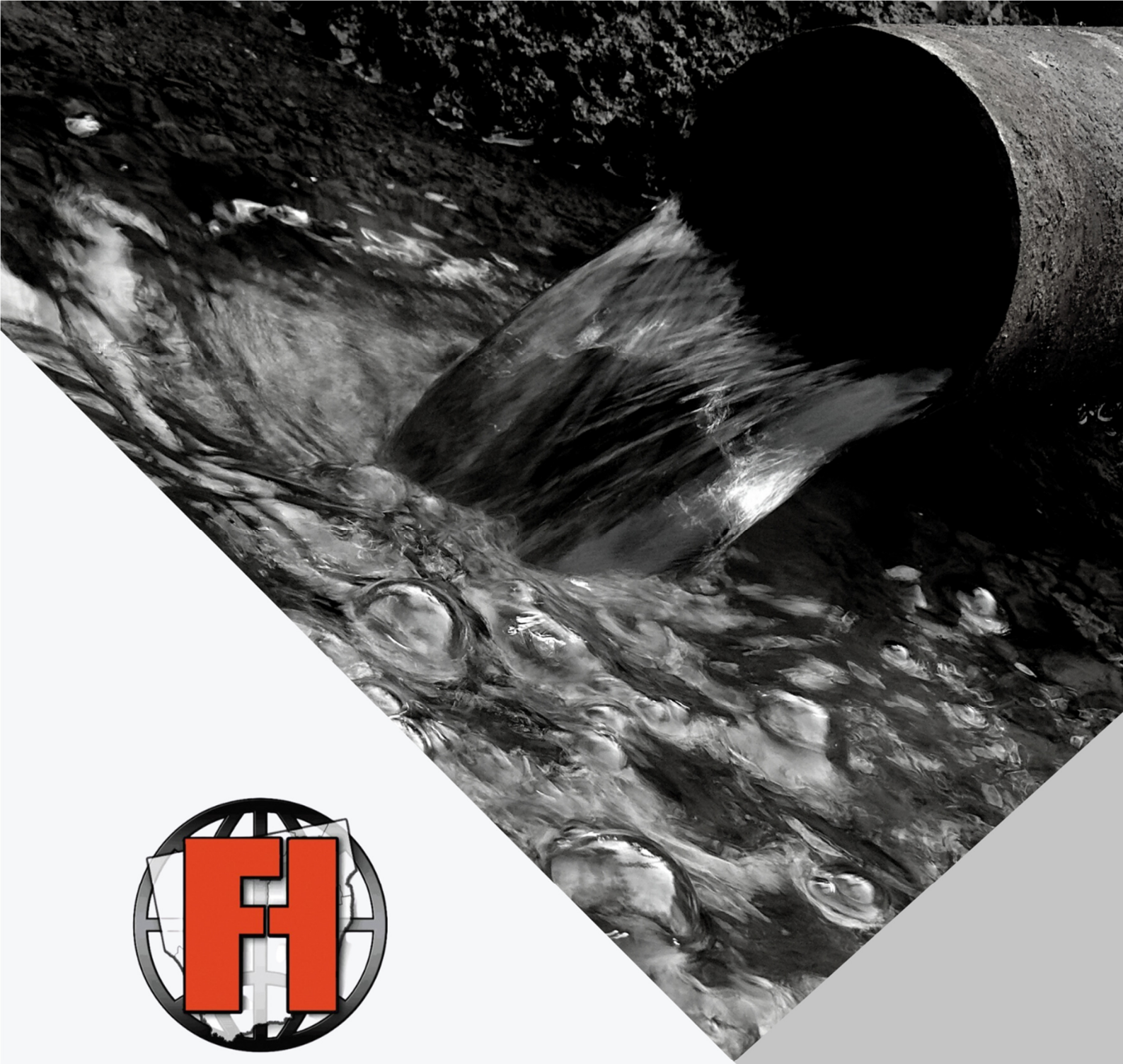

FHP CONSULTING ENGINEERS

SERVICES REPORT

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Reg. No. 2008/018506/07

FHP CONSULTING ENGINEERS (PTY) LTD.

SPECIALISTS IN CIVIL & MUNICIPAL ENGINEERING

2022-03-07 Ref. 7369/001

The Municipal Manager
P O Box 99
KLERKSDORP
2570

Sir

PROPOSED SUBDIVISION OF A PORTION OF THE REMAINING EXTENT OF PORTION 337 and 338 OF THE FARM ELANDSHEUVEL 402-IP

ENGINEERING SERVICES PLANNING REPORT – WATER AND SANITATION

Attached: **Annexure A** – proposed site layout sketch plan; indicated civil services

General:

The property is situated on the south-western corner of the Ian Street and Wilke Avenues in Klerksdorp. Approximate coordinates for the development are:

Description	Coordinates
Latitude	26°50'48.74"S
Longitude	26°39'8.42"E

Ian Street (Leemhuis Street) is a north/south connecting street linking the N12, approximately 2km southwest of the development and the R30 (Ventersdorp Road), approximately 450m north-east of the planned development.

Portion 1 with an area of 7458m^2 is currently zoned as Business 2. A few assumptions was made for the development future use and a 0.4 FSR was used for calculations below. The northern part of portions 1 is already used for business, while the southern part of portion 1 is currently being used as residential (flats).

Portion 2 with an area of 10028m^2, is currently used for residential purposes and consist of a main house and 5 flats. The current zoning for Portions 2 to 20 is “Agricultural” The aim will be to rezone Portion 2 to “Residential 2” with a maximum density of 25 units per hectare, resulting in a potential maximum of 25 units.

Portion 3 to 20 will remain “Agricultural” zoning. This will result in individual plots not exceeding 5000m^2 per plot.

All calculations in this report were done according to the Guidelines for Human Settlement Planning and Design, compiled under the patronage of the Department of Housing, commonly referred to as the "Red Book".

The relevant municipal authority is THE CITY OF MATLOSANA.

The following aspects of the engineering services will be discussed:

1. **Roads and traffic**:

The tables below provide a summary of the trip generation of the **existing** land-use in the AM and PM peak periods respectively:

AM Peak	Trip Rate	% In	% Out	Trips In	Trips Out	Total Trips
Dwelling	1,00	25%	75%	1,25	3,75	5,0
Apartment	0,65	25%	75%	0,81	2,44	3,3
Business				69,3	44,0	113,3
						121,59

PM Peak	Trip Rate	% In	% Out	Trips In	Trips Out	Total Trips
Dwelling	1,00	70%	30%	3,50	1,50	5,0
Apartment	0,65	70%	30%	2,28	0,98	3,3
Business				153,3	152,2	305,5
						313,75

The tables below provide a summary of the expected trips to be generated by the **proposed** land-use:

AM Peak	Trip Rate	% In	% Out	Trips In	Trips Out	Total Trips
Dwelling	1,00	25%	75%	4,25	12,75	17,0
Apartment	0,90	25%	75%	5,63	16,88	22,5
Business				69,31	44,03	113,3
						152,84

PM Peak	Trip Rate	% In	% Out	Trips In	Trips Out	Total Trips
Dwelling	1,00	70%	30%	11,90	5,10	17,0
Apartment	0,90	70%	30%	15,75	6,75	22,5
Business				153,3	152,2	305,5
						345,0

The number of trips expected to be generated by the existing **approved** land-use is 121.6 and 314 trips during the AM and PM peaks respectively. The actual trips currently **generated** due to the current utilisation of portions 37 and 38 of farm Elandsheuvel 402-IP is however expected to be much lower than the approved land-use.

The expected trips the proposed re-zoning will generate will therefore add **31** additional trips to the adjacent road network.

Access will be taken as follows:

- Access to Ptn.1 (business) will be obtained from Ian Street **(Point A, Annexure A**), thereby maintaining the status quo. The Ian St access will form a 4th leg towards the north-west, opposite Steyn St.
- Ptn.2 (Residential 2) will take access from Wilke St.

- The remaining 17 portions of agricultural small holdings will take access from both Wilke St and Ian St. **See Drawing 2-1952, Annexure A.**

Reference is made to the Klerksdorp Land Use Management Scheme of 2005. Individual site development plans (SDP) should be developed for the Business and residential 2 zoned erven to ensure compliance to the relevant requirements, including parking requirements and access taken on both Ian St and Wilke St.

2. **Stormwater drainage**:

The site is relatively flat, with natural drainage in a southern direction. The Skoonspruit natural stream approximately 500m south of the planned development. Drainage within the development will be surface drainage towards Leemhuis Street. There seems to be an earth channel, on the western side of Leemhuis street that will be utilized to carry any surface runoff from the development towards the Skoonspruit stream.

Storm water reticulation within individual erven should be managed in order to minimize concentrated flow onto adjacent properties.

3. **Water:**

The Local Authority will be responsible for sufficient bulk water supply and water pressure to the boundary of the development. The developer will be responsible for the design and construction of the internal water supply network to the requirements of the Local Authority.

Based on the information received from the Municipality, there seems to be a **100 mm Ø** water pipe in Wilke Street from where the development will be able to connect. We expect more services to the east of the development, however this was not indicated on the received information from the Municipality. Connection point to the development is currently assumed to be in Wilke Street, to be confirmed by the Municipality, as no above-ground infrastructure could be verified. (**Point B, Annexure A).**

The expected water consumption for the development is as follows:

Description	Unit demand	Development area / units	Water Demand
Business (7458m^2)	400 ℓ / 100m^2	2983 m^2	AADD = 11,932 ℓ/day
Residential 2	600 ℓ / unit	25	AADD = 15,000 ℓ/day
Agriculture	1200 ℓ / unit	17	AADD = 20,400 ℓ/day
TOTAL			**AADD = 47,332 ℓ/day**

AADD = Average Annual Daily Demand

Description	Classification	Flow
Peak factor	4x (developed area)	2.19 ℓ/sec
Fire flow		15.00 ℓ/sec
TOTAL		**17.19 ℓ/sec**

4. **Sanitation**:

The Local Authority will be responsible for the supply of bulk sewerage services. The developer will be responsible for the design and construction of the internal sewer network. All indications are that available capacity in the reticulation and treatment works are available to support this development.

Existing sewer infrastructure are available to the east and south of the property. Our recommendation is to connect to the existing infrastructure on the south-eastern boundary, on the existing 450mm diameter sewer line. Proposed connection point is indicated **as Point C on Annexure A.**

The internal gravitation sewerage pipeline (minimum 110mm diameter) will be constructed by the developer and all individual units will be supplied with a sewer connection.

The invert level of the available sewer pipe should be checked and designs to be done to ensure connection to this pipe is possible. For small developments minimum gradient of 1:60 is recommended for the 110mm diameter sewer pipe.

All new internal pipelines will be provided with individual, cleaning, and rodding eyes. The developer will be responsible for the cost of the construction of the internal sewerage system to the specification and design standards of the Local Authority.

The maximum projected total average daily sewer effluent flow is as follows:

Description	Unit demand	Development area / number dwellings	Sewer Demand
Business	400 ℓ / 100m^2	2983 m^2	ADWF = 11,932 ℓ/day
Residential 2	450 ℓ / unit	25	ADWF = 11,250 ℓ/day
Agriculture	900 ℓ / unit	17	ADWF = 15,300 ℓ/day
TOTAL			**ADWF = 38,482 ℓ / day**

Description	Classification	Flow
Peak factor	2.5x (developed area)	1.113 ℓ/sec
Storm water infiltration	15%	0.167 ℓ/sec
TOTAL (PWWF)		**1.280 ℓ/sec**

ADWF = Average Dry Weather Flow

PWWF = Peak Wet Weather Flow

Solid waste:

All solid waste will be collected by the Local Authority at the relevant entrances of the development and disposed of at the municipal waste disposal site. Waste for business units is estimated at 85 ℓ/100m^2/week.

The projected volume of normal waste is as follows:

Description	Unit demand	Development area / units	Waste volume (estimate)
Business (ground floor)	85 ℓ / 100m^2	2983	2.535 m^3 / week
Residential 2	240 ℓ / unit	25	6.000 m^3 / week
Agriculture	240 ℓ / unit	17	4.080 m^3 / week

Total waste expected to be approximately 12.6m^3 / week

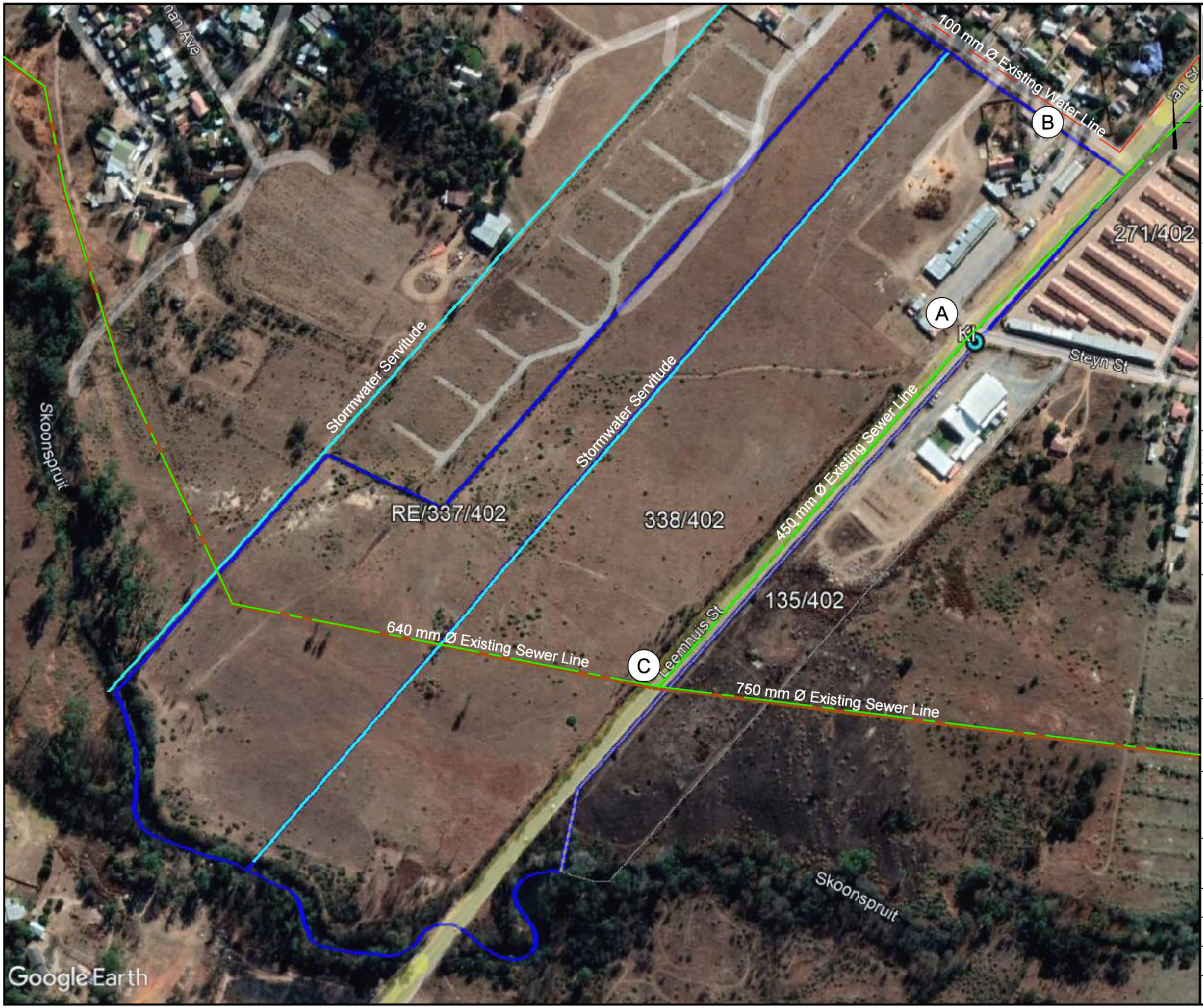
For electrical comments refer to the Electrical Engineering Services Report.

Yours sincerely,

A P Joubert

PrTech Eng.

ECSA REG. NO. 201070144



ANNEXURE A

Algemene notas/ General notes:

LEGEND:

Site

Storm water (INFRASTRUCTURE)

Sewer — X mm Dia Sewerpipe

Water — X mm Dia Waterpipe

Belangrike Nota: Important Note:

ALLE MATES MOET OP TERREIN NAGEGAAN WORD EN STRENG VOLGENS GOEDGEKEURDE LG DIAGRAM GESKIED.
ALL DIMENTIONS MUST BE CHECKED ON TERRAIN WITH THE APPROVED LG DIAGRAM.

DATUM DATE	NR NO	WYSIGINGS / AMENDMENTS	GOEDGEKEUR APPROVED

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AP JOUBERT
Pr Tech. Eng. ECSA Reg. No. 201070144

PROJEK: PROJECT:

337 & 338 ELANDSHEUWEL, KLERKSDORP

TEKENING: DRAWING:

FIGURE 1

ONTWERP: DESIGNED:	RO	SKAAL / SCALE	
GETEKEN: DRAWN:	RO	1 :500	
NAGESIEN: CHECKED:	APJ	PLAN NR/NO:	WYSIGING: REVISION
DATUM: DATE:	FEB 2022	7369-00-01	