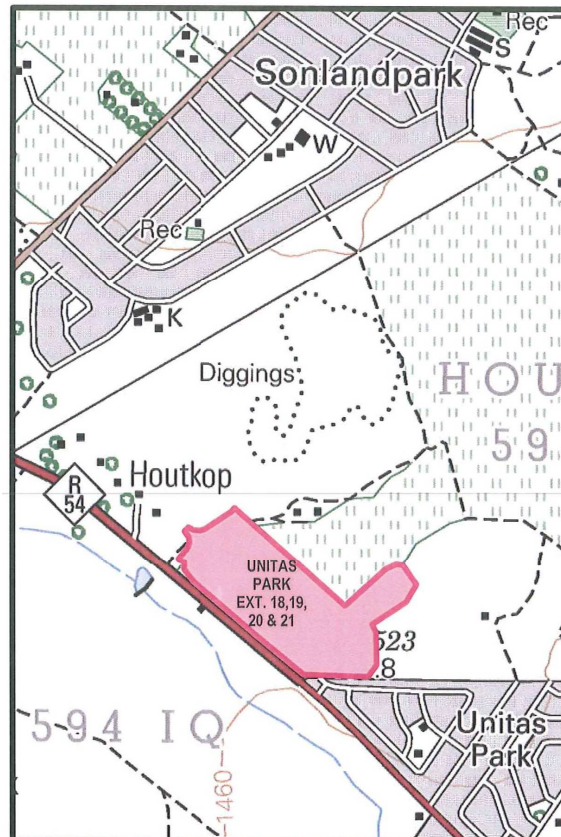


EXISTING AND PROPOSED CIVIL SERVICES REPORT

For Unitas Park Extension 18 – 21, Vereeniging – Gauteng Province



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November 2018

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Township Development of Unitas Park Extensions 18 – 21, Vereeniging – Gauteng Province

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INTRODUCTION

1.1 Appointment

Jeffrey & Co Consulting Engineers has been appointed by Mr Hans van Heerden of Schulden Properties (Pty) Ltd to prepare an Existing and Proposed Civil Services Report for the approved townships of Unitas Park Extension 18 – 21 (previously approved as Unitas Park Extension 17). The Townships fall within the jurisdiction of the Emfuleni Local Municipality.

1.2 Scope of the Report

The scope of this report is to identify the availability of bulk water and sewer services and road and stormwater infrastructure required for the development and to outline the preliminary designs (level of services and design standards) of the internal engineering services.

1.3 Parties Involved

Emfuleni Local Municipality:

Water/Sanitation Planning & Assets:
Salome Strydom / Zanele Mudau – (016) 986 8315
Roads & Stormwater:
Jean Squirra – (016) 950 5584

Engineering Consultants:

Jeffrey & Co Consulting Engineers
Shane Jeffrey – (016) 932 3003

Town Planning Consultants:

SMR Town and Regional Planners
Sonja Meissner Roloff – (012) 665 2330

2 PROJECT DETAILS

2.1 Project Name

The project is referred to as the Unitas Park Extensions 18 – 21 Townships (previously known as Unitas Park Extension 17), Vereeniging – Gauteng Province and is a mixed use development as described in Section 3.2 below, with a public garage included.

2.2 Locality

The property is situated just north of Houtkop Road (P24-1/future K180) in Unitas Park, Vereeniging (see attached **Annexure A** - the township layout SMR190_Div3(6) by Messrs. Sonja Meissner-Roloff Town & Environmental Planning).

The site encompasses a total of approximately 22,653 ha.

The location of the Townships is also indicated on **Annexure A** on the Town Planner drawing.

3 SITE DESCRIPTION

3.1 Zoning

3.1.1 Zoning

Unitas Park Extension 18 – 21 is presently zoned as per Emfuleni approvals given in early 2018. The approved land uses are contained in section 3.2.

3.1.2 Servitude's

All existing and future / planned servitudes will be addressed as part of the conditions of establishment. The developer shall at its own expense cause the conditions / servitudes which affect the townships adversely to be altered, suspended or removed.

3.2 Proposed Development

The site layout of Unitas Park Extension 18 – 21 indicating the existing and future bulk civil services is included in **Annexure B**.

The total site area is approximately 22,653 hectares and the proposed areas of development are as follows:

EXTENSION & ZONING	NUMBER OF ERVEN	AREA (ha)
Extension 18 – Special for Filling Station	1 (Erf 1)	0,6367
Extension 18 – Special for Builder's Yard	1 (Erf 2)	0,7433
Extension 19 – Business 1	1 (Erf 3)	7,0080
Extension 20 – Special for Service Industries	31 (Erf 4-34)	3,0608
Extension 21 – Residential 4	1 (Erf 35)	8,0499
Total area (ha)	35	22,6530

3.3 Topography

The area is lying at an altitude of approximately 1 465 meters above sea level (masl) and sloping to the south. The land has an even slope of between 2% and 4% from the north to the south. The townships are not affected by a 1:100 year flood line.

The area is covered mainly by grass while some scattered trees are also present.

3.4 Geology

A geotechnical investigation was undertaken for Unitas Park Extension 18 – 21, and the general results are as indicated on the Town Planning Layout in **Annexure A**.

Zone 1 - Area largely reflecting a low susceptibility of all-size sinkhole and subsidence formation with respect to ingress of water and a low to medium susceptibility of large-size sinkhole and subsidence formation with respect to groundwater level drawdown.

Zone 2 - Area largely reflecting a low to medium susceptibility of large-size sinkhole and subsidence formation with respect to ingress of water and groundwater level drawdown.

4 AVAILABILITY OF BULK SERVICES

4.1 Water

4.1.1 Bulk Services

In consultation with Zanele Mudau of the Emfuleni Local Municipality, the water supply for the townships of Unitas Park Extensions 18 – 21 will be from the existing 375mm dia line in Gary Player Street south east of these developments. A new connection to this line will be made and a new bulk 250mm dia water line will be constructed, approximately 1,3km in length all along Houtkop road as indicated on the civil services layout plan in Annexure B. This new bulk line will also cater for other future developments.

Based on the township applications approved and the zoning of the developments, taking cognizance of the Red Book standards, the development will have an AADD of 700 Kl, as more clearly depicted in Section 5 of this report.

Expected water consumption for the development is estimated to be;

• x1 Special erf (for a filling station)	: 5 kl/day
• x1 Special erf (for a builder's yard)	: 5 kl/day
• x31 Special erven (for services industries)	: 110 kl/day
• x1 Business 1 erf (20 000m ² GLA shopping centre)	: 80 kl/day
• x1 Residential 4 erf (with 1 000 units)	: <u>500 kl/day</u>
Total daily water consumption for the development estimated at	: 700 kl/day

The Emfuleni Local Municipality, through their master planning consulting engineers Ilifa Africa Engineers, has confirmed that the developments can be supplied from the upgrades to the Langerand Reservoir (completed in October 2008). The Emfuleni Local Municipality however requires that the Residential 4 stand in Extension 21 be fed by an internal reservoir and booster pump system to be built by the Land Owner, based on the 500kl/day that will be required to service the anticipated 1000 unit development. A letter from Ilifa Engineers is attached in Annexure C. Bulk Service Contributions must be negotiated with the Emfuleni Local Municipality.

4.2 Sanitation

4.2.1 Bulk Services

The sewer reticulation for the proposed development will be connecting the 600mm dia bulk sewer south west of the existing Houtkop Road as indicated in Annexure B of this report.

The sewage run-off for the development is estimated to be approximately 528 Kl/day, as more clearly depicted in Section 5 of this report.

Expected sewage runoff for the development is estimated to be;

• x1 Special erf (for a filling station)	: 4 kl/day
• x1 Special erf (for a builder's yard)	: 4 kl/day
• x31 Special erven (for services industries)	: 85 kl/day
• x1 Business 1 erf (20 000m ² GLA shopping centre)	: 60 kl/day
• x1 Residential 4 erf (with 1 000 units)	: <u>375 kl/day</u>
Total daily sewage runoff for the development estimated at	: 528 kl/day

The Emfuleni Local Municipality, through their master planning consulting engineers Ilifa Africa Engineers, has confirmed that sewage runoff from the development can be accepted via the bulk outfall sewer that was installed immediately south of the site (installed to serve the larger Unitaspark/Sonlandpark and the Department of Housing's Kwaggastroom & Sebokeng developments). This was again confirmed by Zanele Mudau of the Council.

Upgrading of the Leeuwkuil WWCW will have to be considered depending on the time frame and phasing of the developments. Any such upgrading has to be financed from the Capital Contributions or alternatively it is suggested that an internal waste water treatment plant be built for Extension 21 (Res 4 development), of which it will be constructed and managed as per the policy of Emfuleni Local Municipality until such time that the Leeuwkuil WWCW has been upgraded. The detail design and necessary application for operating permits will be done before development on the Residential 4 stand in Extension 21 will continue.

Bulk Service Contributions must be negotiated with the Emfuleni Local Municipality.

4.3 Roads & Access

The developments that will take place at Unitas Park Extension 18 – 21 'fits' and the accesses thereto comply with the regional Roads Master Planning, including that of the future K55 directly east of the development, P24-1 (future K180) directly south of the development, and also the class 3 order roads planning in the larger vicinity. Future K55's road reserve has been excluded from the developments.

Two Traffic Studies have previously been compiled :

- A Traffic Impact Study for the larger area (Unitaspark Ext's 2, 4, 8, Sonlandpark Ext's 6, 7, 8 and the Lenong developments on the Cronjé Trust land) was conducted during March 2008 and submitted to the Local Authority as well as Gautrans. This study was approved by the Authorities, and formed the basis of the surrounding roads planning.
- A site specific Traffic Assessment for the previous Unitas Park x17 township (now only made into 4 phases – Extensions 18 to 21) has been compiled, and submitted with the township application that has been approved recently.
- A new main access road off Houtkop Road will have to be constructed. The traffic analyses indicate that the intersection with Houtkop Road has to be signalised.
- Provision has to be made on the SDP for Erf 3 (Shopping Centre site) for a public transport facility. The filling station site will not have direct access off future K180.

Bulk Service Contributions must be negotiated with Emfuleni Local Municipality.

4.4 Stormwater

The properties / townships are not affected by any flood line.

Stormwater run-off from the development is expected to be substantial. With large paved areas and hard surfaces the runoff is expected to increase dramatically. Some form of attenuation might be required to contain post-development peak run-offs to predevelopment peak run-offs. The development will also probably have to accept some stormwater runoff from the upstream Unitas Park Ext. 16 residential township, depending on the (larger) stormwater management plan for the area.

The Local Authority will require a detailed Stormwater Management Plan for the property. The SMP will be compiled after proclamation, and submitted to the Authorities for approval.

Bulk Service Contributions must be negotiated with Emfuleni Local Municipality.

5 LEVEL OF SERVICE AND DESIGN STANDARDS

5.1 Water Supply

5.1.1 Internal Services

Based on the proposed development outlined in section 3.2 of the report the estimated daily demand of the development is approximately 700 Kl/day and an estimated peak flow of 32,4 l/s using an instantaneous peak flow factor of 4.

5.1.2 Proposed Design Standards

Design standards will be as per the Guidelines for Human Settlement Planning and Design and the following design standards are proposed:

A full water network, with a metered connection to each stand, is proposed. Water and sewer services may share the same trenches. Depending on the phasing of the proposed developments, Council will allow the high density residential Res 4 stand to be developed if an internal reservoir with booster pump system is installed.

Estimated water consumption	400l/day/100m ² gross floor area for business sites and 500l/day for Residential 4
Min residual head during peak flow	24m
Instantaneous demand peak factor	4 (max)
Fire demand	Moderate risk at 1500l/min and duration of 4 hours
Pipe material	uPVC class 12 Z-lock
Pipe size	90mm dia. Min
Pipe cover	1.0m minimum
Trenches	Widths to SABS1200, class B bedding, backfilling to 93% mod AASHTO backfilling to 95% mod AASHTO in road reserves
Valves	Waterworks type, Cast Iron, clockwise closing, opposite splay pegs, 'Messrs Salberg' type concrete box – blue lid colour as specified by the Council
Hydrants	Underground type with bayonet coupling opposite splay pegs, 'Salberg' concrete – yellow lid colour as specified by the Council
All site connections	90mm dia for erven – metered
Hydrant spacing	180m on 90mm dia min and special fire for filling station.
Pipe position	To be determined when site plans are available.

5.2 Sanitation

5.2.1 Internal Services

Based on the proposed development outlined in section 3.2 of the report the estimated daily flow from the development is an estimated 528 Kl/day. Peak flow will be catered for due to the residential component of the development.

A full water borne sanitation system is proposed connecting to the existing outfall sewer line of Emfuleni Local Municipality. If upgrading to the Leeuwkuil WWCW is not possible due to shortfall on capital contributions payable, will a package plant be built and operated for the Res 4 stand in Extension 21 in terms of the policy and by laws of the Emfuleni Local Municipality.

5.2.2 Proposed Design Standards

Design standards will be as per the Guidelines for Human Settlement Planning and Design and the following design standards are proposed:

Sewage Outflow:	75% of water daily water usage
Daily Peak Factor:	Nil
Infiltration factor:	15% Minimum
Minimum Velocity	0,7m/s
Minimum gradients:	1:120 for 100mm dia. 1:200 for 150mm dia. 1:300 for 200mm dia. 1:500 for 300mm dia.
Maximum manhole spacing:	80 metres
Pipe material	uPVC class 34 solid wall
Pipe cover	0,6m minimum at head, over 1,0m generally
Manholes	Precast concrete rings
Pipe position	Various

5.3 Internal Roads

Design standards will be as per the Guidelines for Human Settlement Planning and Design and the following design standards are proposed:

It will be a requirement that the development have access as per attached Annexure A and to be approved by Gautrans.

All roadways will be surfaced, kerbed and associated stormwater will be installed.

Final geometric and pavement / structural designs will be submitted to Emfuleni Local Municipality for approval before any construction starts.

5.4 Stormwater reticulation

It is proposed that the developments on the Unitas Park Extensions 18 – 21 Townships be served by a conventional storm water drainage system consisting of inlet structures, underground pipes in conjunction with roadways as well as open channels. Stormwater system(s) will be installed upon approval of the engineering designs approved by the EMfuleni Local Municipality.

The above will be detailed once the site development plans becomes available.

As previously mentioned, the site is not affected by the 1:100 year floodline.

6 CONCLUSIONS AND RECOMMENDATIONS

- Bulk water supply – Based on the above and as per consulted with Salome Strydom and Zanele Mudau of Metsi A Lekoa, bulk water supply is available for the development of Uritas Park Extension 18 – 21. Depending on phasing of the developments, an internal reservoir and booster pump system may be required for the Res 4 development in Extension 21.
- Bulk sewer supply – Based on the above and as per consulted with Salome Strydom and Zanele Mudau of Metsi A Lekoa, bulk sewer supply is available for the development of Uritas Park Extension 18 – 21. Depending on the phasing of the developments it may be required that the Leeuwkuil WWCW will need some upgrading or alternatively a sewer package plant will be built for the Res 4 development in Extension 21.
- Road infrastructure – The development traffic can be accommodated on the existing road network with no additional upgrading required. Road construction will be done taking cognisance of the Traffic impact Assessment.
- Stormwater drainage – Stormwater will be discharged to the southern side of the site by means of an underground stormwater network into the existing stormwater system. The development is not affected by the 1:100 year floodline.
- The Townships of Uritas Park Extension 18 -21 has been approved recently and the conditions of establishment is available.
- Based on this report the Land Owner will enter into a mutually satisfactory Service Level Agreement with Emfuleni Local Municipality.

Annexure A

Annexure B

Annexure C