Project No: 071133

Updated Traffic Assessment

Proposed Township Unitas Park x17 (on Part of Por 224 of Houtkop 594IQ)

SS Short *Pr Eng*
Consulting Engineer
Tel 083 450 2398 Fax 086 659 6843
ssshort@mweb.co.za

Associate Member
TRINAMICS
Consulting Engineers
Since 1974

November 2017

1. Background

In 2008 there were proposals for new mixed use affordable housing residential townships situated on the vacant land surrounding Houtkop Road (P24-1/future K180). These included the townships Unitaspark Ext's 2, 4, 8, Sonlandpark Ext's 6, 7, 8 and the Lenong developments on the Cronjé Trust land. At the time, a combined Traffic Assessment (dated March 2008) was conducted for the larger area, and submitted and accepted by the Local Authority & Gautrans. However, due to the slump in the housing market the developments never proceeded.

An application was in March 2017 submitted for the commercial development situated on Part of Por 224 of Houtkop 594IQ, known as Unitas Park x17. The development falls under jurisdiction of the Emfuleni Local Municipality.

We were requested to attend to an *updated* site specific Traffic Assessment for this development, taking into account the amendments to the township layout that were approved by the Emfuleni Local Municipality, to determine the impact that the additional traffic generated will have on the adjacent road network, and also to comment on the access requirements and the necessary road upgradings.

2. The development

The property is situated just north of Houtkop Road (P24-1/future K180) in Unitas Park, Vereeniging (see attached township layout plan SMR190_p11 by Messrs. Sonja Meissner-Roloff Town & Environmental Planning). The township layout provides for :

- x1 *Special* erf 1 (for a filling station) of 6 367m^2
- x1 *Special* erf 2 (for a builder's yard) of 7 433m^2
- x1 *Business 1* erf 3 (for a 22 000m^2 - 24 000m^2 GLA shopping centre) on 7.0097ha
- x4 *Special* erven 4-7 (for a 24-bed day hospital) on 7 586m^2
- x27 *Special* erven 8-34 (for services industries) on 23 065m^2
- x1 *Street* on 3.1544 ha

Note that no Site Development Plans are as yet available, as this is at township establishment stage.

3. Access

Gautrans has (via their letter dated 13 Oct 2008) granted a new access point off P24/2 (future K180) at a spacing of 510m west of the intersection with future K55.

This access road has a 25m reserve width, and will also serve a portion of the future residential township Unitas Park Ext. 16, and also the vacant land to the west of Unitas Park x16. It can therefore be considered a bulk service.

A traffic circle (at the intersection Pomegranate & Apricot Streets) is envisaged to distribute traffic to the commercial and residential portions.

4. Traffic counts

Two 12-hour traffic counts were conducted just west of the property at the intersection of Houtkop Road (future K180) & the Waterdal Road (future K170) on Wednesday 10 Sep 2014 and Saturday 6 Sep 2014 between the hours 06h00 and 18h00, to get a feel for the traffic volumes along these roads :

- the weekday AM peak is from 06h30 to 07h30
- the weekday PM peak is from 16h30 to 17h30
- the Saturday peak is from 11h30 to 12h30
- heavy vehicles range between 11% and 13%

5. Trip Generation Rates

Appropriate Trip Generation Rates were estimated using the *SA Trip Data Manual TMH17 Vol. 1 (Sep 2012)* and the *South African Trip Generation Rates (June 1995)* :

a. filling station : intercepts 3.5% of pass-by trips plus 15.8% new traffic
b. builder's yard : 2.8 trips/100m^2 in the AM peak hour, 5.5 trips/100m^2 in the PM peak hour and 11 trips/100m^2 in the Saturday peak hour
c. day hospital : 0.2 trips/bed in the AM peak hour, 0.2 trips/bed in the PM peak hour and 0.4 trips/bed in the Saturday peak hour
d. services industries : 1.0 trips/100m^2 in the AM peak hour, 1.1 trips/100m^2 in the PM peak hour and 1.1 trips/100m^2 in the Saturday peak hour
e. shopping centre : a base TGR of 3.4 peak hour trips /100m^2 GLA multiplied by a size factor and certain reduction factors :
    - the size factor (for 24 000m^2) was calculated as 1.764

- a reduction factor P_v of 30% was assumed for areas with low vehicle ownership
- a reduction factor P_t of 0% was assumed for the property situated next to a transit zone
- a reduction factor P_m of 0% for mixed use developments
- TGR therefore calculated as 4.2 peak hour trips /100m^2 GLA
- pass-by trips interception rate estimated at 30%

f. self-storage units : no data, but very low @ 0.1 trips/100m^2 in any peak hour

6. Estimated Trip Generation in the peak hours

Using the above Trip Generation Rates, the estimated peak hour traffic volumes (veh/hr) to the development can be summarised as follows :

	AM in	***AM out***	***PM in***	***PM out***	***Sat in***	***Sat out***
filling sta intercept	27	27	40	40	30	30
filling sta new	4	4	6	6	5	5
builder's yard	34	18	51	51	102	102
services industries	90	48	76	76	76	76
24-bed day hospital	2	2	2	2	5	5
shopping c intercept	28	15	151	151	151	151
shopping c new	66	35	353	353	353	353
total intercepted	55	42	191	191	181	181
total new	194	106	486	486	536	536
total (using new intersection)	249	149	677	677	717	717
storage facility (on erf 35)	31	17	24	24	24	24

7. Target year

A target year of 2022 was chosen for the analysis. All background traffic was increased by a nominal 3% per annum, to which the development traffic was then added.

8. Traffic Analysis

A traffic analysis was conducted at the new intersection off Houtkop Rd (P24-2/future K180) using the Sidra Intersection ver. 7 traffic analysis software. Since this is a new intersection, there is no existing scenario. The development traffic was added to the expected traffic volumes on Houtkop Road for the target year in 2022, in both weekday AM & PM peak hours, and also for the Saturday peak hour.

The analyses results then indicated the following :

- The peak hour traffic volumes along Houtkop Road, when projected to 2022 volumes, are expected to be in the order of 1 841 veh/hr in the AM peak, 1 990 veh/hr in the PM peak, and 1 222 veh/hr in the Saturday peak.
- The new intersection to the development has to be signalised - it is oversaturated should priority control (with a 'Stop' on the side road) be implemented.
- With signalisation, expected Levels of Service in the 2022 target year are all excellent. These are LOS A in the AM peak hour, LOS B in the PM peak hour, and LOS B in the Saturday peak hour.
- Expected trip generation to the self-storage units on erf 35 is very low (estimated at around 24 veh/hr max in any peak hour). This additional traffic has no significant influence on the current volumes along Karin Muir and Vic Toweel Streets.
- Save for the new intersection, there appears to be no external geometric roads upgrades required

See the annexures for the detail results of the analyses.

8. Public Transport

It is proposed that a public transport facility (taxi rank) be incorporated in the layout design of the shopping-centre erf. Should this be implemented, no special arrangements are foreseen to provide additional collection and drop-off points on the other roads.

9. Conclusions and recommendations

From the traffic analysis it is concluded :

- An updated traffic assessment has been prepared in support of the Unitas Park x17 township application. This takes into account the amended township layout that was approved by the Emfuleni Local Municipality in 2017.
- Traffic counts were conducted during Sep 2014 along Houtkop Road. These were projected to target year volumes in 2022.
- Appropriate Trip Generation Rates were established using both the SA Trip Data Manual TMH17 Vol. 1 (Sep 2012) and the South African Trip Generation Rates (June 1995).
- In the Friday PM peak hour, the development is expected to intercept x382 vehicles from the adjacent Houtkop Road, and attract x973 vehicles as new trips – a total of x1 355 veh/hr.
- In the Saturday peak hour, the development is expected to intercept x362 vehicles from the adjacent Houtkop Road, and attract x1 072 vehicles as new trips – a total of x1 434 veh/hr.
- A Section 7 of Act 8 Report was submitted & approved by Gautrans. Conditions were issued, and approval was also granted for a new access point off P24/2 (future K180) to the development.
- This new intersection (off Houtkop Road) to the development has to be signalised.
- At this intersection, and with signalisation, expected Levels of Service in the 2020 target year are all excellent.
- Prior to construction thereof, a Wayleave application will have to be submitted to the Local Authority and Gautrans.
- It appears no other external roads upgrades are required.
- Provision has to be made for a public transport facility on the shopping centre erf.

From a traffic point of view, the Unitas Park Ext. 17 township application is supported.

Straffen Short

SS Short Pr Eng

Nov 2017

10. References

- South African Trip Generation Rates 2nd edition, Department of Transport, June 1995
- Guidelines for Traffic Impact Studies, Department of Transport, October 1995
- Simtra Ver. 4.0, SARB Chair in Transportation Engineering, University of Pretoria, 1991
- SIDRA Intersection ver. 6, Akcelic & Associates, 2013
- Highway Capacity Manual HCM, Transportation Research Board., 1985
- Parking Standards, Department of Transport, November 1985
- TMH16 Vol. 1 SA Traffic Impact & Site Traffic Assessment Manual, Version 1.0, Aug 2012, COTO
- TMH16 Vol. 2 SA Traffic Impact & Site Traffic Assessment Standards & Requirements Manual, Version 1.0, Aug 2012, COTO
- TMH17 Vol. 1 SA Trip Data Manual, Ver 1.0, Sep 2012, COTO
- Guidelines for the Geometric Design of Urban Arterial Roads, CUTA, Draft UTG 1, 1986
- Guidelines for the planning and design of Township Roads and Stormwater drainage, SAICE, 2nd edition, August 1981
- Technical Guidelines and Criteria for Enclosed Neighbourhoods, City of Tshwane Metropolitan Municipality, January 2001
- Vehicle Queue Storage Guidelines for Accesses to Private Developments in Centurion, ITS (Pty) Ltd, July 2001
- South African Engineering Service Contribution Manual for Municipal Road Infrastructure, Version 0.00, April 2011, Committee of Transport Officials (Coto)
- South African Road Classification and Access Management Manual, Version 0.00, April 2011, Committee of Transport Officials (Coto)
- South African Traffic Impact and Site Traffic Assessment Manual, Version 0.00, April 2011, Committee of Transport Officials (Coto)
- South African Traffic Impact and Site Traffic Assessment Standards and Requirements Manual, Version 0.0, June 2011, Committee of Transport Officials (Coto)
- National Guidelines for Road Access Management in South Africa (RAM), Oct 2005, Committee of Transport Officials (Coto)

TRAFFIC NOMENCLATURE AND DEFINITIONS

Traffic nomenclature used in this report include the following :

- Vph : vehicles per hour
- pcu : passenger car unit (1 heavy = 3 pcu, 1 combi-taxi = 1.5 pcu)
- km/h : kilometres per hour
- V/C : volume/capacity ratio
- LOS : Level of Service

The following definitions apply :

- Capacity : the maximum hourly rate at which vehicles can reasonably be expected to traverse a point of a lane during a given time period under prevailing roadway, traffic and control conditions
- Volume : the hourly rate (vph) at which traffic traverses a point in a lane
- V/C : the volume/capacity ratio which is a measure of saturation
- LOS : Level of Service which is a qualitative measure describing operational conditions within a traffic stream and their perception by motorists or passengers

The "Highway Capacity Manual" defines the concept of *level of service* as a qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers. A level of service definition generally describes these conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety.

Six levels of service are defined, given letter designations, from LOS A to LOS F, with LOS A representing the best operating conditions and LOS F the worst :

- *LOS A* represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream. The general level of comfort and convenience provided to the motorist or passenger is excellent. For unsignalised intersections this implicates little or no delay.
- *LOS B* is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Level of comfort and convenience provided is somewhat less

than LOS A, because the presence of others in the traffic stream begins to affect individual behaviour. For unsignalised intersections this implicates short traffic delays.

- *LOS C* is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by the interactions of others in the traffic stream. The general level of comfort and convenience declines noticeably at this level. For unsignalised intersections this implicates average traffic delays.
- *LOS D* represents high-density, but stable flow. Speed and freedom to maneuver are severely restricted, and the driver or pedestrian experiences a generally poor level of comfort and convenience. For unsignalised intersections this implicates long traffic delays.
- *LOS E* represents operating conditions at or near capacity level. All speeds are reduced to a low, but relatively uniform value. Comfort and convenience are extremely poor, and driver or pedestrian frustration is generally high. For unsignalised intersections this implicates very long traffic delays.
- *LOS F* is used to define forced or breakdown flow. Queues form behind such locations.

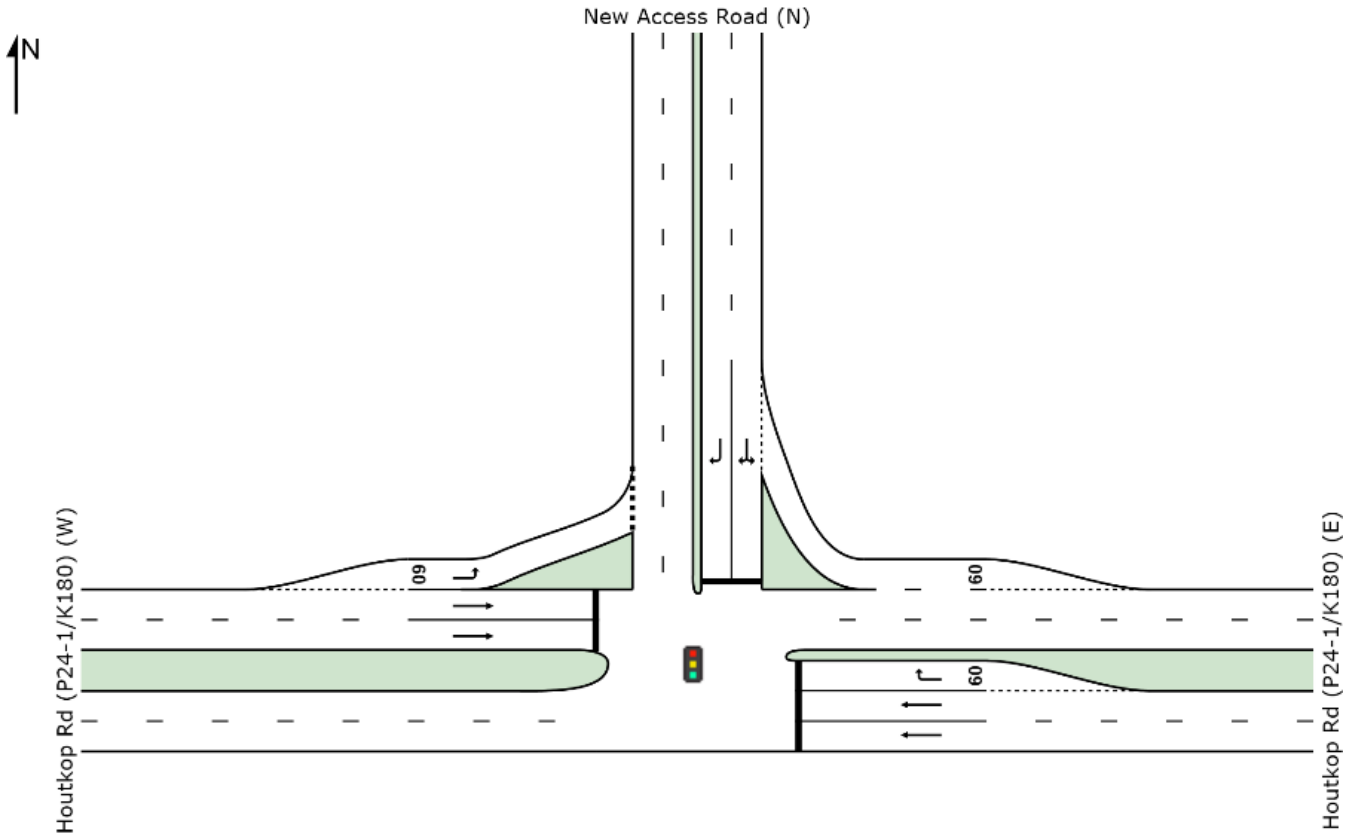
In urban conditions, planners usually choose a LOS of D as desirable, and LOS E as maximum. Similarly, it is good planning practice to keep the V/C ratio below 0.9.

The definitions of LOS on priority controlled- and signalised intersections according to the SIDRA User Guide (based on the Highway Capacity Manual) are given below.

Description of Level of Service for Intersections

Level of Service (LOS)	Overall control delay (seconds)	
	Priority controlled	Signalised
A	< 10	< 6.5
B	10 – 15	6.5 – 19.5
C	15 – 25	19.5 – 32.5
D	25 – 35	32.5 – 52.0
E	35 – 50	52.0 – 78.0
F	> 50	> 78

New Access to Township : proposed geometrics (standard Gautrans spec)



MOVEMENT SUMMARY

Site: 1 [2022 AM Peak]

TIA for Unitas Park x17
Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Houtkop Rd (P24-1/K180) (E)											
5	T1	692	13.0	0.257	2.8	LOS A	3.3	25.8	0.35	0.30	57.4
6	R2	131	3.0	0.332	11.2	LOS B	1.4	10.0	0.65	0.73	45.2
Approach		822	11.4	0.332	4.2	LOS A	3.3	25.8	0.40	0.37	55.8
North: New Access Road (N)											
7	L2	78	3.0	0.281	28.4	LOS C	2.7	19.2	0.89	0.76	34.5
9	R2	78	3.0	0.281	32.6	LOS C	2.7	19.2	0.94	0.74	31.8
Approach		156	3.0	0.281	30.5	LOS C	2.7	19.2	0.91	0.75	33.1
West: Houtkop Rd (P24-1/K180) (W)											
10	L2	131	3.0	0.100	6.5	LOS A	0.5	3.5	0.25	0.61	49.9
11	T1	1245	13.0	0.582	8.6	LOS A	11.6	90.1	0.68	0.61	52.6
Approach		1376	12.1	0.582	8.4	LOS A	11.6	90.1	0.64	0.61	52.5
All Vehicles		2354	11.2	0.582	8.4	LOS A	11.6	90.1	0.57	0.53	52.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1 [2022 PM Peak]

TIA for Unitas Park x17
Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Houtkop Rd (P24-1/K180) (E)											
5	T1	1208	13.0	0.520	6.5	LOS A	9.7	75.6	0.59	0.53	54.2
6	R2	357	3.0	0.551	14.6	LOS B	4.9	35.4	0.85	0.80	42.4
Approach		1565	10.7	0.551	8.3	LOS A	9.7	75.6	0.65	0.59	52.0
North: New Access Road (N)											
7	L2	357	3.0	0.725	26.5	LOS C	12.3	88.6	0.94	0.88	35.5
9	R2	357	3.0	0.725	31.2	LOS C	12.3	88.6	0.98	0.89	32.5
Approach		714	3.0	0.725	28.9	LOS C	12.3	88.6	0.96	0.89	33.9
West: Houtkop Rd (P24-1/K180) (W)											
10	L2	357	3.0	0.298	7.5	LOS A	2.4	17.5	0.39	0.67	49.0
11	T1	886	13.0	0.762	23.0	LOS C	13.0	101.0	0.96	0.91	43.6
Approach		1243	10.1	0.762	18.5	LOS B	13.0	101.0	0.80	0.84	44.6
All Vehicles		3522	8.9	0.762	16.1	LOS B	13.0	101.0	0.76	0.74	45.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1 [2022 Saturday Peak]

TIA for Unitas Park x17
Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Houtkop Rd (P24-1/K180) (E)											
5	T1	708	13.0	0.322	6.4	LOS A	5.2	40.1	0.53	0.46	70.2
6	R2	377	3.0	0.505	13.9	LOS B	5.7	41.0	0.79	0.79	42.9
Approach		1085	9.5	0.505	9.0	LOS A	5.7	41.0	0.62	0.57	60.6
North: New Access Road (N)											
7	L2	377	3.0	0.671	22.9	LOS C	11.7	83.7	0.89	0.84	37.6
9	R2	377	3.0	0.671	28.2	LOS C	11.7	83.7	0.95	0.85	33.9
Approach		754	3.0	0.671	25.6	LOS C	11.7	83.7	0.92	0.85	35.6
West: Houtkop Rd (P24-1/K180) (W)											
10	L2	377	3.0	0.327	7.6	LOS A	2.9	20.9	0.40	0.67	48.8
11	T1	579	13.0	0.676	24.4	LOS C	8.3	64.3	0.96	0.84	52.2
Approach		956	9.1	0.676	17.8	LOS B	8.3	64.3	0.74	0.77	51.2
All Vehicles		2795	7.6	0.676	16.5	LOS B	11.7	83.7	0.74	0.71	49.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

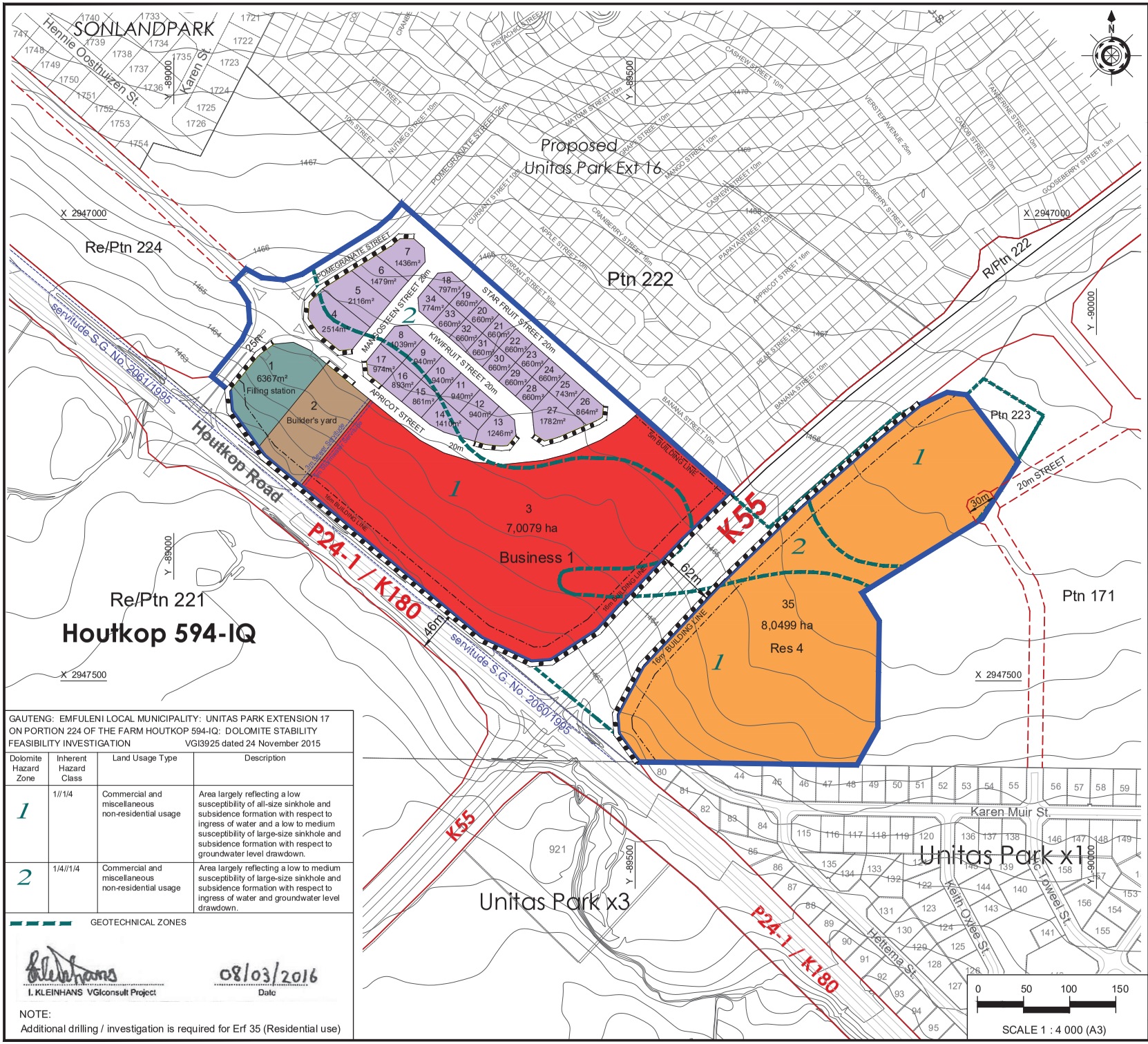
Site: 101 [Pomegranate / Apricot Traffic Circle 2020 Saturday Peak]

TIA for Unitas Park x17
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Pomegranate St (S)											
1	L2	377	1.0	0.362	5.0	LOS A	2.2	15.7	0.48	0.56	51.8
2	T1	377	1.0	0.567	4.8	LOS A	4.6	32.7	0.56	0.59	51.0
3	R2	377	1.0	0.567	10.5	LOS B	4.6	32.7	0.56	0.59	51.4
Approach		1131	1.0	0.567	6.8	LOS A	4.6	32.7	0.54	0.58	51.4
East: Apricot St (E)											
4	L2	377	1.0	0.848	27.2	LOS C	12.9	90.8	1.00	1.37	34.6
5	T1	11	1.0	0.848	27.3	LOS C	12.9	90.8	1.00	1.37	42.0
6	R2	105	1.0	0.848	33.0	LOS C	12.9	90.8	1.00	1.37	42.3
Approach		493	1.0	0.848	28.4	LOS C	12.9	90.8	1.00	1.37	36.8
North: Pomegranate St (N)											
7	L2	105	1.0	0.882	26.6	LOS C	15.3	107.8	1.00	1.42	41.6
8	T1	377	1.0	0.882	26.7	LOS C	15.3	107.8	1.00	1.42	36.4
9	R2	105	1.0	0.882	32.4	LOS C	15.3	107.8	1.00	1.42	42.8
Approach		587	1.0	0.882	27.7	LOS C	15.3	107.8	1.00	1.42	38.9
West: Apricot St (W)											
10	L2	105	1.0	0.745	14.4	LOS B	7.5	53.0	0.94	1.15	46.3
11	T1	11	1.0	0.745	14.5	LOS B	7.5	53.0	0.94	1.15	47.5
12	R2	377	1.0	0.745	20.2	LOS C	7.5	53.0	0.94	1.15	39.7
Approach		493	1.0	0.745	18.8	LOS B	7.5	53.0	0.94	1.15	41.7
All Vehicles		2703	1.0	0.882	17.5	LOS B	15.3	107.8	0.80	1.01	43.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.



GAUTENG: EMFULENI LOCAL MUNICIPALITY: UNITAS PARK EXTENSION 17 ON PORTION 224 OF THE FARM HOUTKOP 594-IQ: DOLOMITE STABILITY FEASIBILITY INVESTIGATION VGI3925 dated 24 November 2015

Dolomite Hazard Zone	Inherent Hazard Class	Land Usage Type	Description
1	1//1/4	Commercial and miscellaneous non-residential usage	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.
2	1/4//1/4	Commercial and miscellaneous non-residential usage	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.

GEOTECHNICAL ZONES

I. KLEINHANS VGIconsult Project — Date 08/03/2016

NOTE:
Additional drilling / investigation is required for Erf 35 (Residential use)

PROPOSED TOWNSHIP

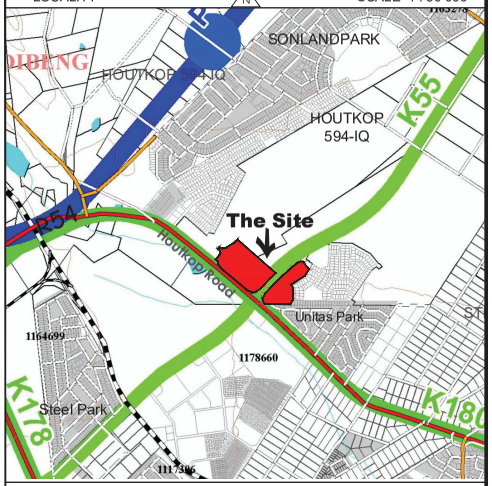
UNITAS PARK EXT. 17

Situated on Part of Portion 224 of the farm HOUTKOP 594-IQ

USES	ERF NO.	No. of Erven	AREA (ha)	%
Special for Filling Station	1	1	0,6367	2.81
Special for Builder's Yard	2	1	0,7433	3.28
Business 1	3	1	7,0079	30.94
Special for Service Industries	4-34	31	3,0608	13.51
Residential 4	35	1	8,0499	35.54
Existing public roads			3,1544	13.92
TOTAL		35	22,6530	100.00

NOTES:
1.) The line denotes the township boundary.
2.) All measurements are approximate.
3.) Line of No Access
4.) Erf 3 is subject to a 5m Building Line as shown on layout plan
5.) Erf 35 is subject to a proposed Right of Way Servitude, 30m wide turning circle
6.) Erf 35 is subject to a further dolomite stability investigation

LOCALITY SCALE 1 : 50 000



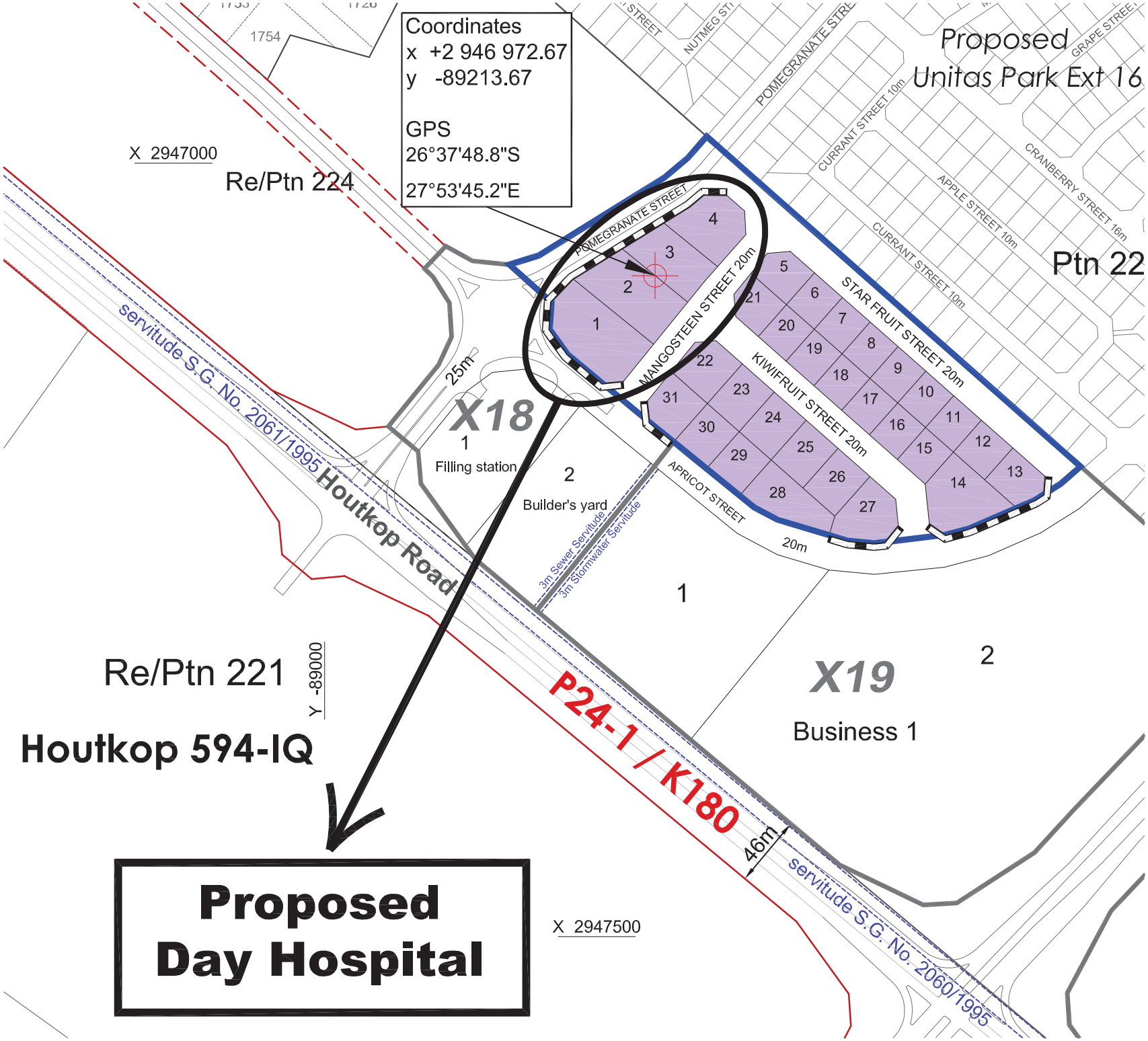
FLOOD LINE:
In terms of the Regulations of Article 144 (Act 36 of 1998), it is hereby stated that this Land Development Area is NOT affected by a flood with an expected frequency of one every 100 years in the public stream.

PR. ING: Pr Eng 910267 DATE: 20 July 2015

LOCAL COUNCIL: EMFULENI LOCAL MUNICIPALITY

Sonja Meissner-Roloff
Town & Environmental Planning
P.O. Box 7194
Centurion
0046
Tel: (012) 665-2330
Fax: (012) 665-2333
Highveld Office Park
Charles de Gaulle Crescent
Highveld
Centurion
Cell: 082 451 9585
E-mail: smeissner@icon.co.za

PLAN NUMBER: SMR190 / p11 DATE: MARCH 2017


Coordinates
x +2 946 972.67
y -89213.67
GPS
26°37'48.8"S
27°53'45.2"E
Proposed
Unitas Park Ext 16
Ptn 22
X 2947000
Re/Ptn 224
1754
POMEGRANATE STREET
MANGOSTEEN STREET 20m
STAR FRUIT STREET 20m
KIWIFRUIT STREET 20m
APRICOT STREET
20m
CURRANT STREET 10m
APPLE STREET 10m
CRANBERRY STREET 16m
GRAPE STREET
NUTMEG ST
25m
X18
1
Filling station
2
Builder's yard
1
2
X19
Business 1
servitude S.G. No. 2061/1995
Houtkop Road
3m Sewer Servitude
3m Stormwater Servitude
P24-1 / K180
46m
servitude S.G. No. 2060/1995
Re/Ptn 221
Y -89000
Houtkop 594-IQ
X 2947500
Proposed
Day Hospital