

TRAFFIC IMPACT STUDY

FOR PARKDENE FILLING STATION, ERF 11221, GEORGE



REPORT VKE11/54.01.Rev00

MARCH 2012

Prepared for:

Aboo Ismail
Lenasia Builders and Developers CC
P.O. Box 6007
Lenasia North
1838



Prepared by:

Vela VKE Consulting Engineers
P.O. Box 10633
GEORGE
6530

TEL: (011) 852 3288

TEL: (044) 873 5029

Table of Contents

1	Introduction.....	1
2	The Proposed Development	1
3	Existing Road Network and Access Points.....	1
4	Traffic Counts	2
5	Trip Generation	3
6	Trip distribution.....	3
7	Operational Analysis.....	4
7.1	2012 -Traffic with the proposed new development.....	5
7.2	2017 - Traffic with proposed new development.....	8
8	Summary and Recommendations	12
9	Bibliography.....	13
	ANNEXURE A.....	14
	FIGURES.....	14
	ANNEXURE B.....	15
	TRAFFIC VOLUMES.....	15
	ANNEXURE C	16
	SIDRA RESULTS	16

1 Introduction

Vela VKE has been appointed by Lenasia Builders and Developers CC to conduct a Traffic Impact Assessment for the proposed Parkdene filling station development, within the George municipal area. The locality and site plan of the proposed development is shown in **Figure 1, ANNEXURE A**. The study will look at the effect of the traffic generated by the new filling station development on the road network, and where necessary introduce mitigation measures.

The study will be in accordance with the guideline document of the Department of Transport titled, "Manual for Traffic Impact Studies".¹

2 The Proposed Development

The development proposal consists of a new filling station and shopping space with a total covered area of $\pm 288\text{m}^2$. **Figure 2, ANNEXURE A** shows the development plan.

3 Existing Road Network and Access Points

The proposed access points from the development connect onto Main Street and Golf Street. Main Street and Golf Street is situated within the George Municipal area and connects to Sandkraal Road, which gives access to the N2-National Road. Due to the higher order road status of Sandkraal Road, no direct access will be allowed from the filling station site.

The photo below shows the proposed location for the access from Main Street. Sight distance from both the access points is acceptable. The proposed new entrance is further than 20m from the Sandkraal Road signalized junction as describe in the "Geometric Design of Urban Collector Roads, Draft UTG 5"² guideline document.

¹ Manual for Traffic Impact Studies

² Geometric Design of Urban Collector Roads, Draft UTG 5



4 Traffic Counts

A 12-hour week day count was recorded on 8 November 2011 at the intersection of Sandkraal Road and Main Street. This traffic count was analysed and used to extract the traffic volumes for the morning (AM) and afternoon (PM) peak hours. The peak hour volumes obtained from the counting data is shown in Table 1.

Table 1: 2011 Peak hour volumes

LOCATION	PEAK HOUR VOLUME	
	AM	PM
Sandkraal Road from George CBD	1425	1368
Sandkraal Road from Thembaletu	1363	1256
From Main Street into Sandkraal Road	509	413
From Vuyani Ncamazana into Sandkraal Road	221	147

These 2011 volumes will be growthed at 3% per annum to obtain the 2012 base year volumes and the 2017 design horizon volumes. The traffic counts are also represented graphically in **Figure 3**, **ANNEXURE A** and the recorded traffic volumes can be seen in **ANNEXURE B**.

5 Trip Generation

The document “South African Trip Generation Rates, 2nd Edition,”³ was used as the guideline document to obtain the peak hour trips generated by the proposed new filling station development. Trip generation values for a filling station in urban areas were used. The document states **“The recommended trip generation rate of service stations in urban areas in terms of the percentage traffic attracted from the adjacent street(s) is 4.0% during the morning peak hour, 4.0% the afternoon peak hour, and also 4.0% during both 12 and 24 hour periods. It is also recommended to assume that 16% of the trips attracted by service stations are new, that is additional traffic on the street network.”** The expected peak hour trips are shown in **Table 2**.

Table 2: Trips generated in the peak hour (2012)

PROPOSED LAND-USE	RATE	TRIP GENERATION	IN/OUT SPLIT	PEAK HOUR TRIPS	
				Week day AM OUT/IN	Week day PM OUT/IN
Filling Station - Urban Area	Current traffic 4%	4% x Volume	50/50	11/11	10/10
Filling Station - Urban Area	New traffic 16%	16% x Volume	50/50	42/42	34/34
				53/53	44/44

Generated peak trips for the AM and PM will be superimposed on the growthed background traffic and simulated to obtain the effect of the development traffic on the existing road network.

6 Trip distribution

The trip distribution to and from the proposed development during the peak hour will be split as in **Figure 4, ANNEXURE A**.

During the AM peak hour

- 44% of trips will move towards the east on Main Street
- 56% of trips will move towards the west on Main Street

³ South African Trip Generation Rates, 2nd Edition,

During the PM peak hour

- 66% of trips will move towards the east on Main Street
- 34% of trips will move towards the west on Main Street

The above distribution rates were obtained from the traffic counts at the proposed access point. The generated trips to and from the proposed development will make use of access points onto Main Street and Golf Street.

7 Operational Analysis

The operational analysis is done with the “SIDRA INTERSECTION 5.1”⁴ computer software that is suited for traffic engineering capacity analysis. When elements of a road network such as intersections are analysed, their operating conditions are described in terms of Level of Service (LOS). The six letters from A to F are used to indicate different LOS. LOS A indicates very low traffic flows with correspondingly low delays. LOS E reflects capacity conditions, with high delays and unstable flow. LOS F reflects conditions where traffic demand exceeds capacity and traffic experiences congestion and delays. Generally LOS A to D is considered acceptable in accordance with international standards. LOS E and F on the other hand are considered to be unacceptable.

The Average Delay is the delay in seconds that a motorist is likely to experience on an approach to the junction, while waiting for the junction to clear or other vehicles to manoeuvre. A further measure of the operating conditions prevailing at any point in a road network is the volume to capacity ratio (v/c). As the name implies it is the traffic demand volume divided by the available capacity of the road element. Generally ratios of up to approximately 0.9 are internationally considered acceptable. Values exceeding 1.0 implies saturation of the facility.

The Future 2017 AM and PM peak hour with the development traffic is shown in **Figure 5, ANNEXURE A**. The results of the SIDRA analysis are shown in **ANNEXURE C**.

⁴ SIDRA INTERSECTION 5.1

7.1 2012 -Traffic with the proposed new development

Table 3 and Table 4 shows a summary of the operational performance analysis for the existing signalized intersection at Sandkraal Road and the new T-junction at the filling station for the AM and PM peak hours. The background traffic and the generation of the new filling station were used in the analysis.

Table 3: 2012 Operational performance: Sandkraal Road signalized junction for the AM & PM peak hours

APPROACH	MOVEMENT	AM PEAK HOUR			PM PEAK HOUR		
		LEVEL OF SERVICE (LOS)	AVERAGE DELAY (seconds)	VOLUME/CAPACITY RATIO	LEVEL OF SERVICE (LOS)	AVERAGE DELAY (seconds)	VOLUME/CAPACITY RATIO
Sandkraal from N2 (South)	Left	C	24.0	0.782	B	18.7	0.447
	Through	B	15.8	0.782	B	10.5	0.447
	Right	C	30.2	0.725	C	31.5	0.501
Main Street (East)	Left	C	27.2	0.631	C	24.6	0.306
	Through	B	19.0	0.631	B	16.4	0.306
	Right	C	27.1	0.631	C	24.5	0.306
Sandkraal from George CBD	Left	B	17.0	0.156	B	17.6	0.269
	Through	B	10.7	0.479	B	13.8	0.735
	Right	C	32.2	0.191	C	22	0.085
Vuyani Street (West)	Left	C	24.1	0.198	C	24.1	0.206
	Through	B	15.9	0.198	B	15.9	0.206
	Right	C	24.1	0.198	C	24.2	0.206

From the results it is evident that the junction will operate at an acceptable level for both the AM and PM peak hour for the current (2012) scenario. The figure below shows a schematic layout of the junction.

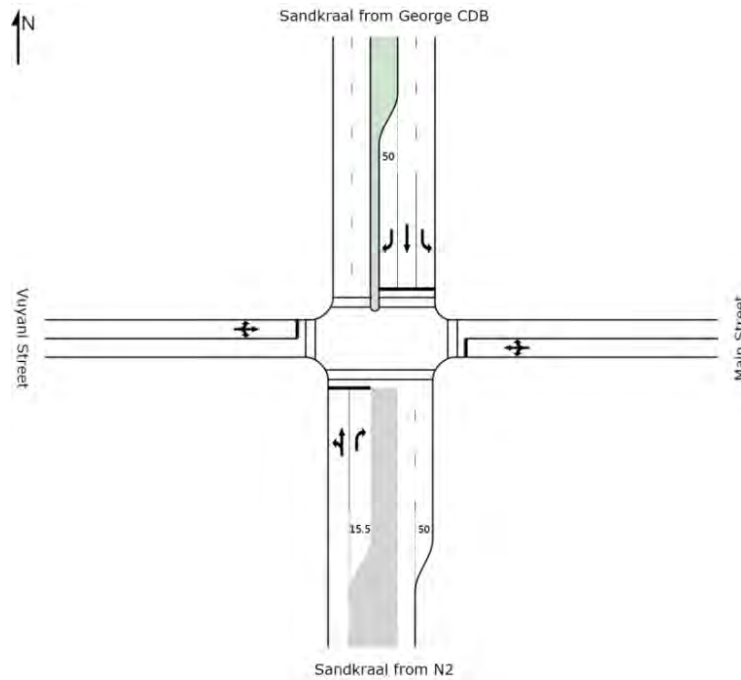
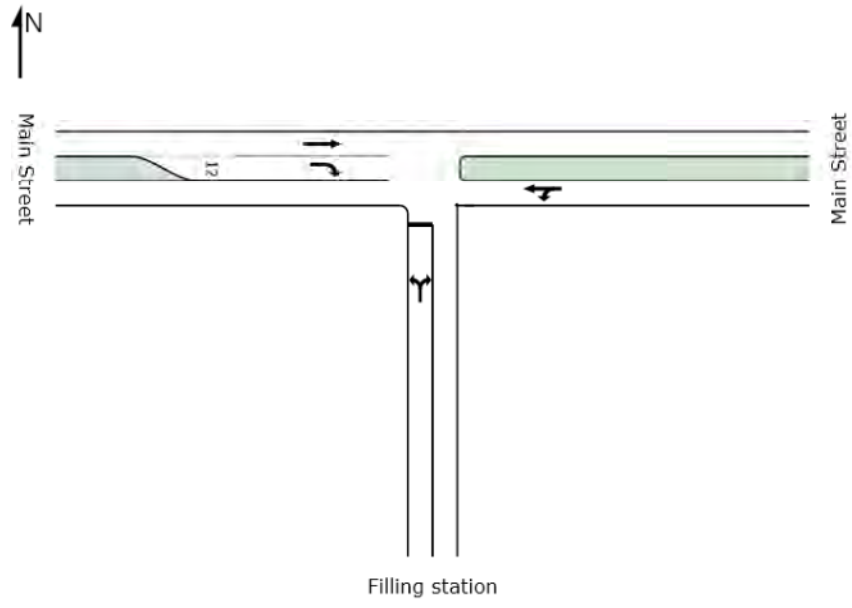


Table 4: 2012 Operational performance: Main Street / Filling Station junction for the AM & PM peak hours

APPROACH	MOVEMENT	AM PEAK HOUR			PM PEAK HOUR		
		LEVEL OF SERVICE (LOS)	AVERAGE DELAY (seconds)	VOLUME/CAPACITY RATIO	LEVEL OF SERVICE (LOS)	AVERAGE DELAY (seconds)	VOLUME/CAPACITY RATIO
Filling station (South)	Left	B	10.2	0.055	A	9.7	0.044
	Right	B	10.1	0.055	A	9.7	0.044
Main Street (East)	Left	A	8.2	0.175	A	8.2	0.086
	Through	A	0	0.175	A	0	0.086
Main Street (West)	Through	A	0	0.125	A	0	0.152
	Right	A	9.5	0.032	A	8.9	0.037

From the results it is evident that the junction will operate at an acceptable level for both the AM and PM peak hour for the current (2012) scenario. The figure below shows a schematic layout of the junction.



7.2 2017 - Traffic with proposed new development

Table 5, Table 6 and Table 7 shows a summary of the operational performance analysis for the existing signalized intersection at Sandkraal Road and the new T-junction from the new filling station for the AM and PM peak hours. The background traffic and the generation of the new filling station of the proposed development were used in the analysis.

Table 5: 2017 Operational performance: Sandkraal Road signalized intersection for the AM & PM peak hours

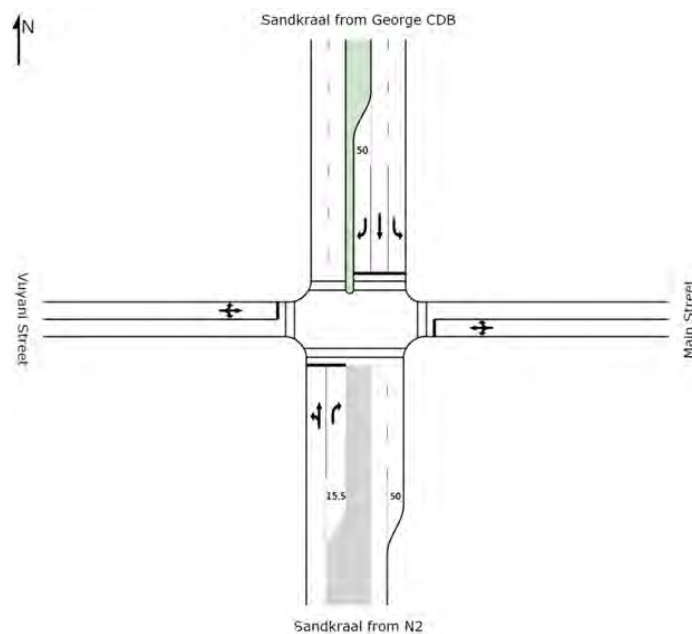
APPROACH	MOVEMENT	AM PEAK HOUR			PM PEAK HOUR		
		LEVEL OF SERVICE (LOS)	AVERAGE DELAY (seconds)	VOLUME/CAPACITY RATIO	LEVEL OF SERVICE (LOS)	AVERAGE DELAY (seconds)	VOLUME/CAPACITY RATIO
Sandkraal from N2 (South)	Left	C	22.3	0.761	B	19.2	0.519
	Through	B	14.1	0.761	B	11.0	0.519
	Right	C	32.8	1.00	D	37.9	0.631
Main Street (East)	Left	E	55.7	0.889	C	25.0	0.357
	Through	D	47.5	0.889	B	16.8	0.357
	Right	E	55.6	0.889	C	24.9	0.357
Sandkraal from George CBD	Left	B	16.6	0.152	B	17.8	0.312
	Through	B	10.6	0.463	C	21.3	0.853
	Right	D	37.8	0.244	C	23.7	0.113
Vuyani Street (West)	Left	D	36.0	0.317	C	24.3	0.245
	Through	C	27.8	0.317	B	16.2	0.245
	Right	D	36.1	0.317	C	24.4	0.245

The results indicate that the right turning lane from Sandkraal Road into Main Street will become saturated in the AM peak hour traffic. This is not acceptable for the 2017 scenario.

To mitigate this problem, an additional phase C (as demonstrated below) should be implemented. Minor changes to the signal heads will be required. The results is shown in the table below.

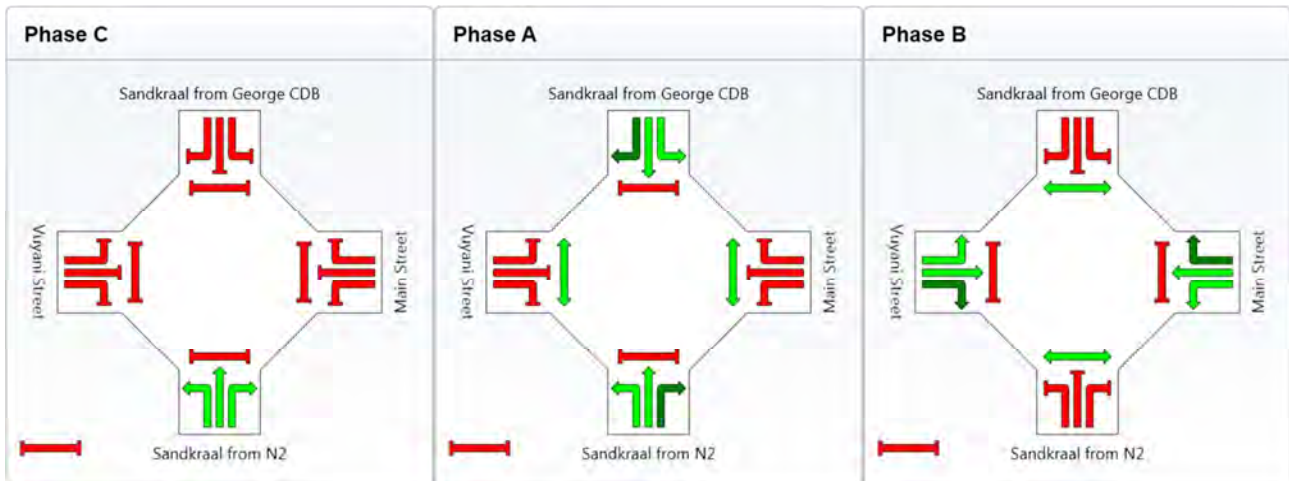
Table 6: 2017 Operational performance: Sandkraal Road signalized intersection with additional phase for the AM & PM peak hours

APPROACH	MOVEMENT	AM PEAK HOUR			PM PEAK HOUR		
		LEVEL OF SERVICE (LOS)	AVERAGE DELAY (seconds)	VOLUME/CAPACITY RATIO	LEVEL OF SERVICE (LOS)	AVERAGE DELAY (seconds)	VOLUME/CAPACITY RATIO
Sandkraal from N2 (South)	Left	C	27.5	0.836	B	19.2	0.519
	Through	B	19.3	0.836	B	11.0	0.519
	Right	C	23.8	0.659	D	37.9	0.631
Main Street (East)	Left	D	37.4	0.800	C	25.0	0.357
	Through	C	29.2	0.800	B	16.8	0.357
	Right	D	37.3	0.800	C	24.9	0.357
Sandkraal from George CBD	Left	C	26.3	0.266	B	17.8	0.312
	Through	C	27.1	0.811	C	21.3	0.853
	Right	D	37.6	0.274	C	23.7	0.113
Vuyani Street (West)	Left	C	28.2	0.270	C	24.3	0.245
	Through	C	20.1	0.270	B	16.2	0.245
	Right	C	28.3	0.270	C	24.4	0.245



Phase Timing Results

Phase	C	A	B
Green Time (sec)	8	24	22
Yellow Time (sec)	4	3	3
All-Red Time (sec)	2	2	2
Phase Time (sec)	14	29	27
Phase Split	20%	41%	39%

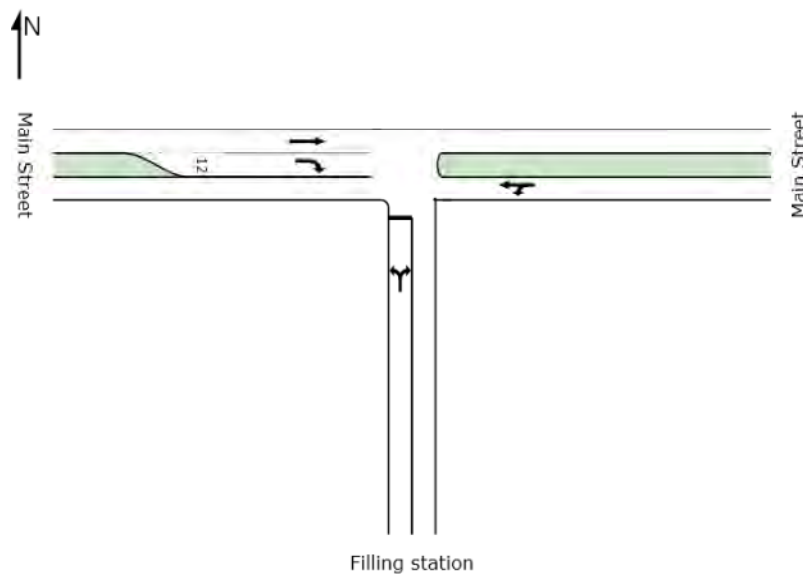


	Normal Movement		Permitted/Opposed
	Slip-Lane Movement		Opposed Slip-Lane
	Stopped Movement		Continuous Movement
	Turn On Red		Undetected Movement
			Phase Transition Applied

Table 7: 2017 Operational performance: Main Street / Filling station junction for the AM & PM peak hours

APPROACH	MOVEMENT	AM PEAK HOUR			PM PEAK HOUR		
		LEVEL OF SERVICE (LOS)	AVERAGE DELAY (seconds)	VOLUME/CAPACITY RATIO	LEVEL OF SERVICE (LOS)	AVERAGE DELAY (seconds)	VOLUME/CAPACITY RATIO
Filling Station (South)	Left	B	10.7	0.071	B	10.2	0.056
	Right	B	10.7	0.071	B	10.1	0.056
Main Street (East)	Left	A	8.2	0.203	A	8.2	0.099
	Through	A	0	0.203	A	0	0.099
Main Street (West)	Through	A	0	0.145	A	0	0.176
	Right	A	9.8	0.038	A	9.0	0.044

From the results it is evident that the junction will operate at an acceptable level for both the AM and PM peak hour for the future (2017) scenario. The proposed right turning lane is designed to be 12m to provide space for 2 standard passenger car vehicles or 1 heavy vehicle. Future queue lengths at the right turning lane out of Main Street are calculated to be 1.8m therefore the designed 12m will be sufficient. The figure below shows a schematic layout of the junction.



8 Summary and Recommendations

During the 2012 weekly AM and PM peak hour traffic, 106 and 88 trips respectively will be generated.

During the 2017 weekly AM and PM peak hour traffic, 122 and 100 trips respectively will be generated.

Two access points is proposed from the development to Main Street and Golf Street.

Taking into account the traffic counts, the development proposal and analysis results the following recommendations are suggested:

- A turning lane with 12m storage length be constructed on the western approach of Main Street.
- A stop line (RTM 1) should be painted and stop sign (R1) be erected at the access junction with Main and Golf Street.
- To mitigate the right turning saturation problem that will occur from Sandkraal Road into Main Street in the AM peak hour traffic, an additional phase should be implemented within the cycle. Minor changes to the signal heads will be required.

Figure 6 in ANNEXURE A will give a graphical summary of the above recommendations.



Author: R. Stander (B Tech Eng)

Reviewer: H. Maart (Pr Tech Eng, MEng , BSc Hons)

9 Bibliography

1. Department of Transport, **Manual for Traffic Impact Studies**, Pretoria, 1995.
2. Committee of Urban Transport Authorities, **Geometric Design of Urban Collector Roads, Draft UTG 5**, Pretoria, South Africa, 1988.
3. Department of Transport, **South African Trip Generation Rates, 2nd Edition**, Pretoria, 1995.
4. Akcelik & Associates, **SIDRA 5.1**, Australia, 1990

ANNEXURE A

FIGURES

FIGURE 1: LOCALITY AND SITE PLAN

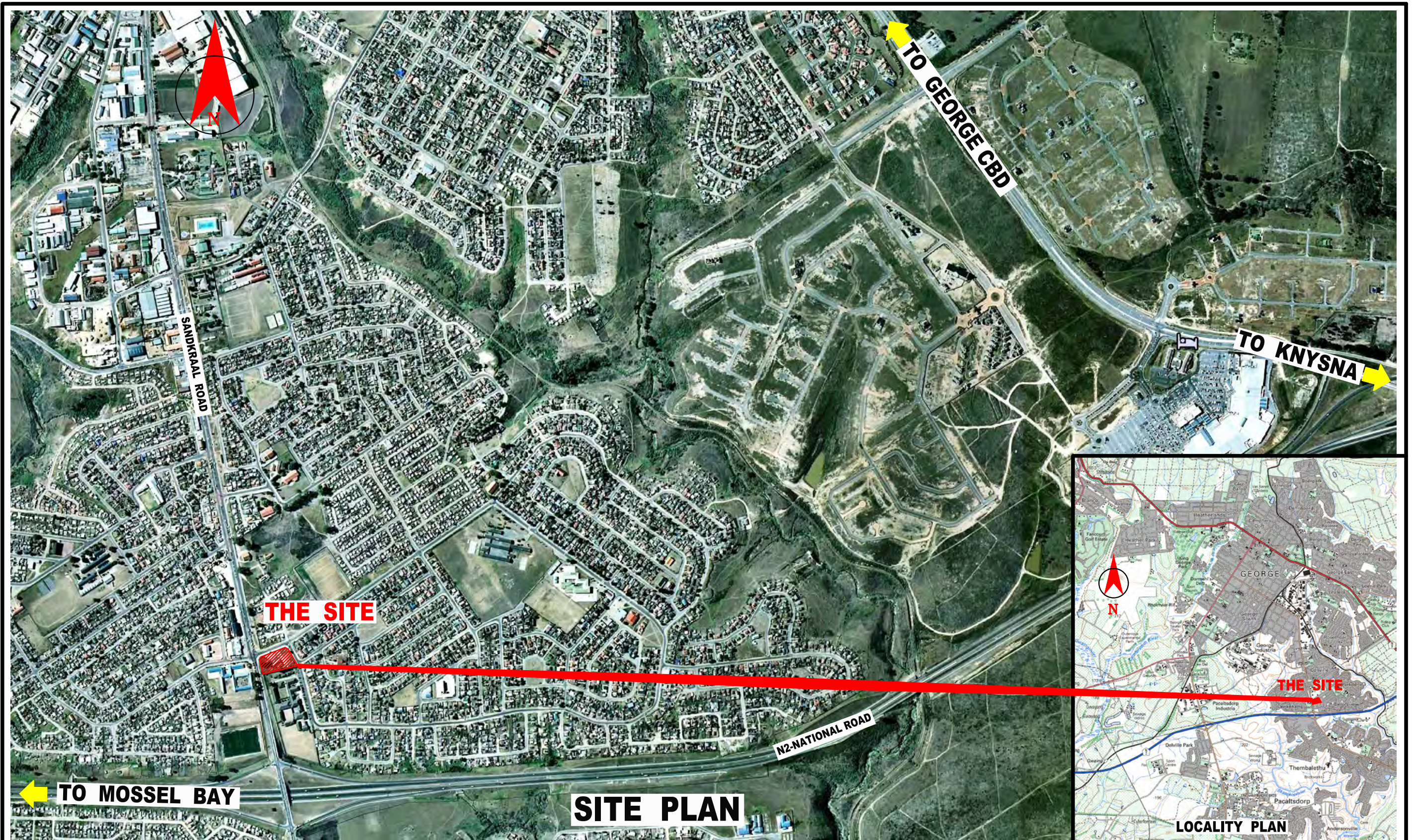
FIGURE 2: PROPOSED DEVELOPMENT

FIGURE 3: 2012 AM & PM PEAK HOUR TRAFFIC WITH DEVELOPMENT

FIGURE 4: TRIP GENERATION AND DISTRIBUTION

FIGURE 5: 2017 A.M. AND P.M. PEAK HOUR TRAFFIC WITH DEVELOPMENT

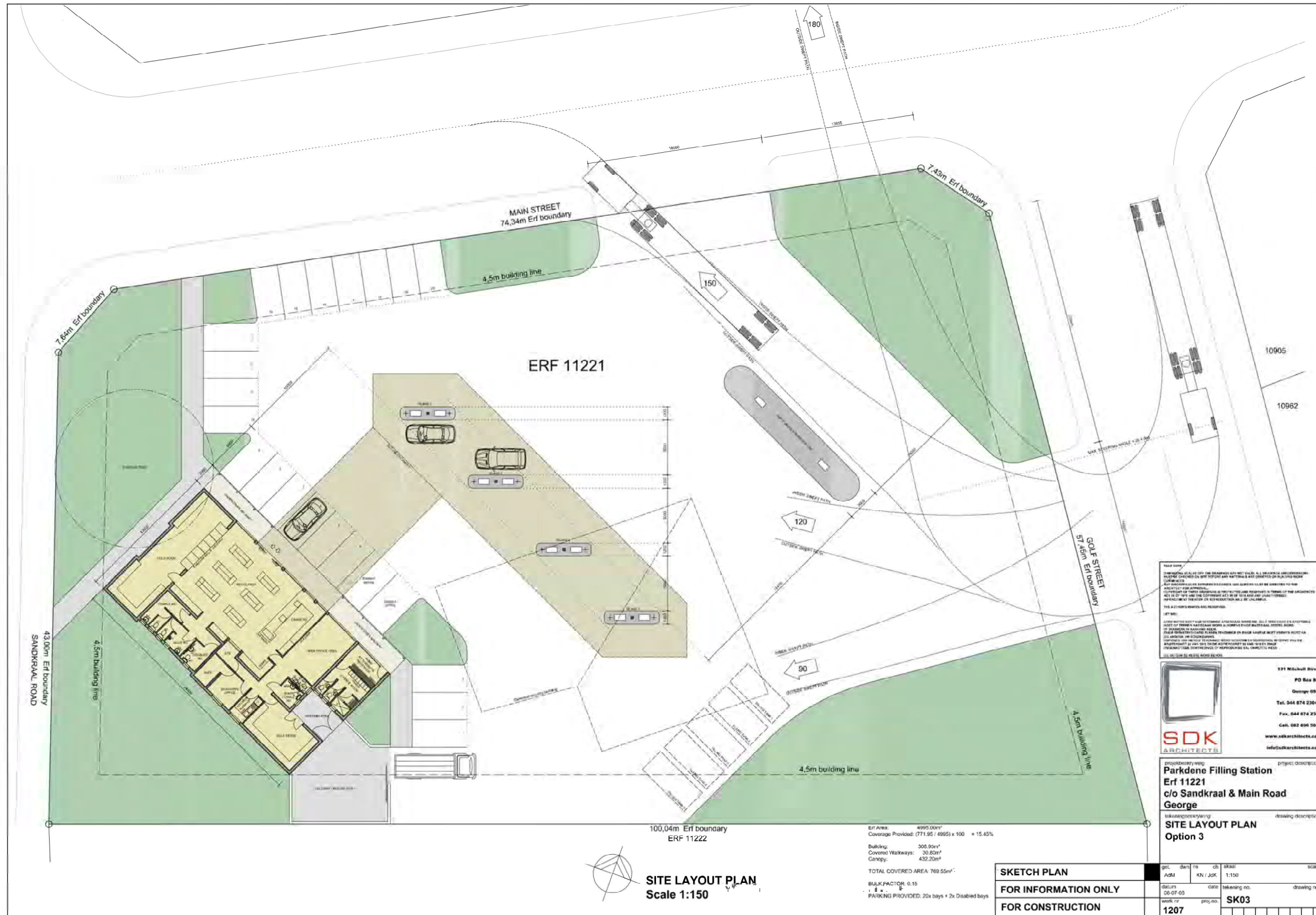
FIGURE 6: PROPOSED RECOMMENDATIONS



LOCALITY PLAN AND SITE PLAN

PROJECT NO : VKE1154
 DATE: MARCH 2012

FIGURE 1



SITE LAYOUT PLAN
Scale 1:150

ERF AREA: 4895.00m²
Coverage Provided: (771.95 / 4895) x 100 = 15.45%
Building: 308.80m²
Covered Walkways: 30.80m²
Canopy: 432.20m²
TOTAL COVERED AREA: 769.55m²
BULK FACTOR: 0.15
PARKING PROVIDED: 20x bays + 2x Disabled bays

SKETCH PLAN	gpc	dm	ns	ch	skk	scale
FOR INFORMATION ONLY	Adm				KN / JOK	1:150
FOR CONSTRUCTION	date	date	date	date	date	drawing no.
	20-07-05					SK03
	work of	proj. no.				
	1207					

NOTES
1. THE CLIENT HAS REVIEWED AND APPROVED THE SITE LAYOUT PLAN AND ALL INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT.
2. THE CLIENT HAS REVIEWED AND APPROVED THE SITE LAYOUT PLAN AND ALL INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT.
3. THE CLIENT HAS REVIEWED AND APPROVED THE SITE LAYOUT PLAN AND ALL INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT.
4. THE CLIENT HAS REVIEWED AND APPROVED THE SITE LAYOUT PLAN AND ALL INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT.
5. THE CLIENT HAS REVIEWED AND APPROVED THE SITE LAYOUT PLAN AND ALL INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT.
6. THE CLIENT HAS REVIEWED AND APPROVED THE SITE LAYOUT PLAN AND ALL INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT.
7. THE CLIENT HAS REVIEWED AND APPROVED THE SITE LAYOUT PLAN AND ALL INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT.
8. THE CLIENT HAS REVIEWED AND APPROVED THE SITE LAYOUT PLAN AND ALL INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT.
9. THE CLIENT HAS REVIEWED AND APPROVED THE SITE LAYOUT PLAN AND ALL INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT.
10. THE CLIENT HAS REVIEWED AND APPROVED THE SITE LAYOUT PLAN AND ALL INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT.

SDK ARCHITECTS
131 Mitchell Street
PO Box 845
George 6530
Tel: 044 874 23045
Fax: 044 874 2307
Cell: 082 895 5647
www.sdkarchitects.com
info@sdkarchitects.com

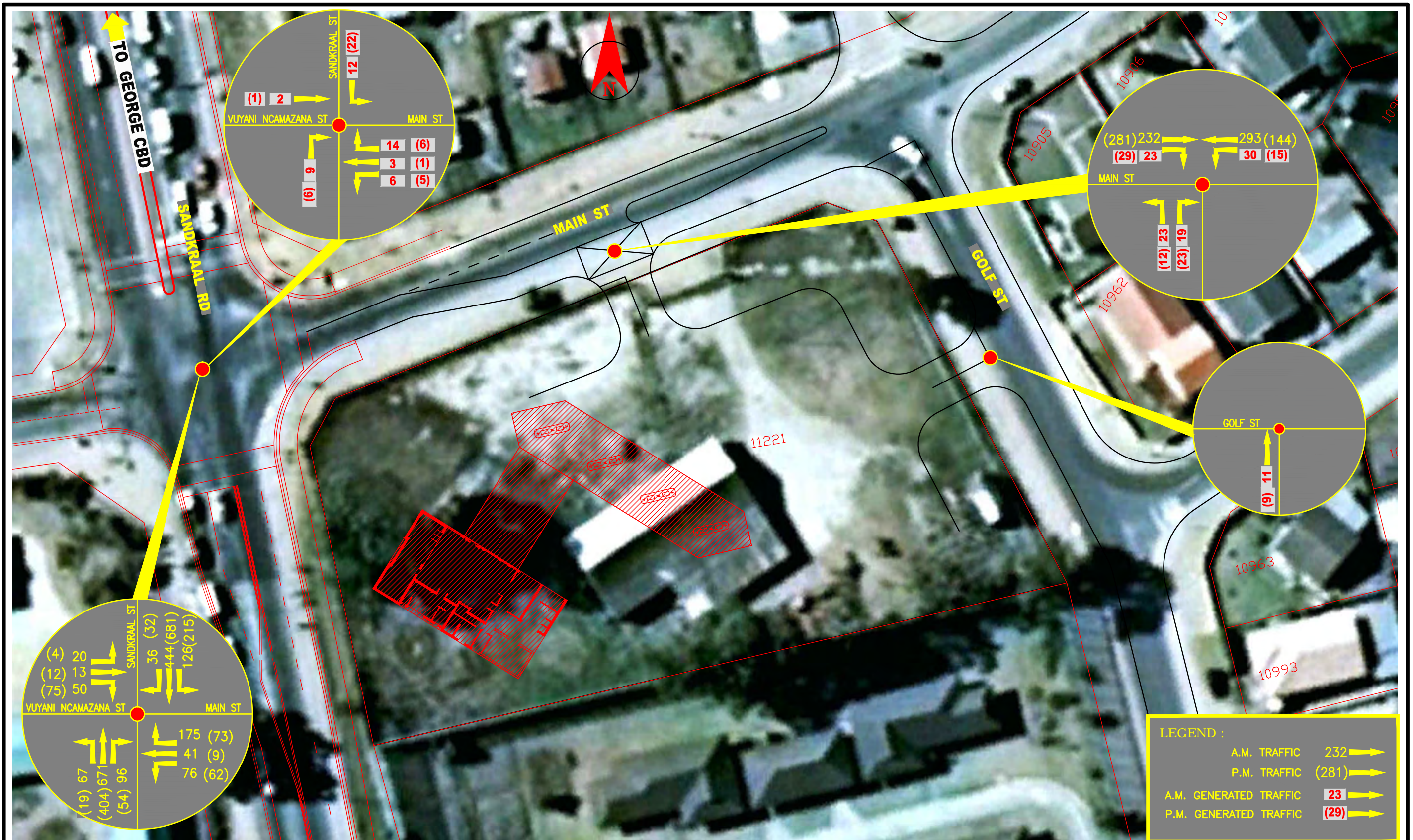
Project description:
Parkdene Filling Station
Erf 11221
c/o Sandkraal & Main Road
George
drawing description:
SITE LAYOUT PLAN
Option 3



DEVELOPMENT PLAN

PROJECT NO : VKE1154
DATE: MARCH 2012

FIGURE 2



TRAFFIC VOLUMES 2012 -- A.M. AND P.M. PEAK HOURS

PROJECT NO : VKE1154
DATE: MARCH 2012

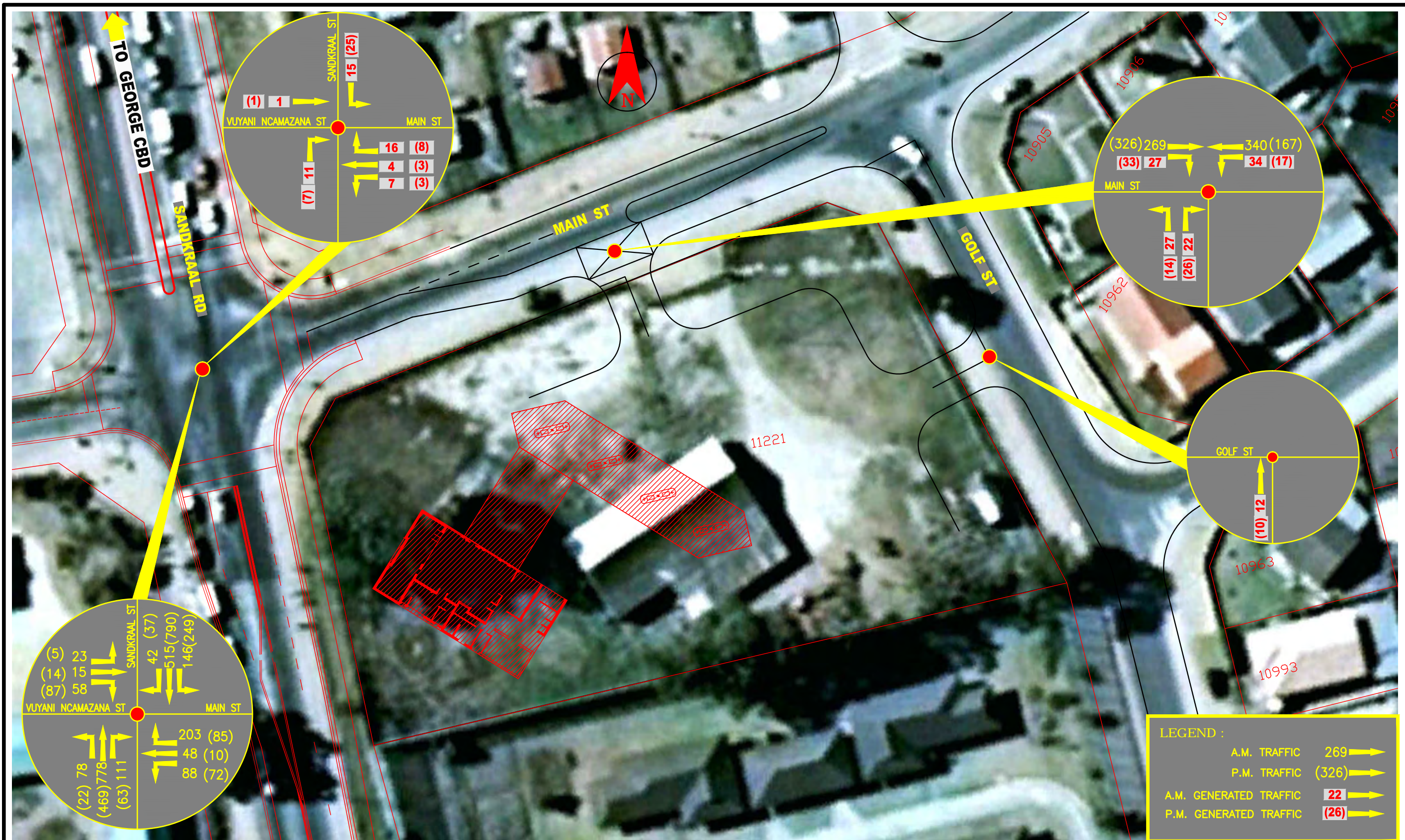
FIGURE 3



TRIP GENERATION AND DISTRIBUTION -- A.M. AND P.M. PEAK HOURS

PROJECT NO : VKE1154
DATE: MARCH 2012

FIGURE 4



TRAFFIC VOLUMES 2017 -- A.M. AND P.M. PEAK HOUR WITH DEVELOPMENT

PROJECT NO : VKE1154
DATE: MARCH 2012

FIGURE 5



PROPOSED RECOMMENDATIONS

PROJECT NO : VKE1154

DATE: APRIL 2012

FIGURE 6

ANNEXURE B

TRAFFIC VOLUMES

- **SANDKRAAL ROAD – 12 HOUR WEEKDAY COUNT**

VERKEERSTELLING TE: TIA for Filling Station in George AANTAL VOERTUIG: 12404 LEËR NO. VKEL154.01

STASIE : 1

DATUM : 08/11/2011

TIPE VERKEER : Ligte

KWARTIER VOLUMES

KWARTIER EINDIG	Sandkraalweg vanaf George SSK			Mainstraat vanaf Parkdene			Sandkraalweg vanaf Thembaletu			Vuyani Ncamazanastraat vanaf L/kamp			TOTAAL	BEW. UUR VOLUME
	Links	Deur	Regs	Links	Deur	Regs	Links	SUID Deur	Regs	Links	WES Deur	Regs		
06h15	11	45	2	12	2	9	2	35	16	0	0	2	136	
06h30	12	42	2	16	4	24	4	56	19	8	4	8	197	
06h45	24	77	6	22	9	43	9	141	18	1	5	14	374	
07h00	20	56	9	12	10	21	10	117	14	4	1	5	285	992
07h15	28	108	7	21	6	51	6	168	29	12	4	14	451	1307
07h30	39	142	13	38	9	61	9	231	28	21	6	17	612	1722
07h45	32	125	6	3	15	37	7	135	22	16	5	2	411	1759
08h00	14	71	4	4	7	25	4	85	4	3	2	18	1693	
08h15	22	86	10	9	0	23	7	85	15	7	2	3	262	1504
08h30	19	75	5	5	5	21	4	62	7	4	0	4	211	1103
08h45	19	130	8	3	0	17	7	57	8	4	4	9	263	955
09h00	12	79	8	7	2	11	3	32	2	1	5	3	165	901
09h15	22	87	5	4	2	10	4	81	4	1	4	9	231	870
09h30	19	87	8	5	1	7	5	37	4	1	0	6	180	839
09h45	16	89	3	3	3	5	3	49	2	0	0	1	176	752
10h00	8	71	2	5	2	9	4	37	4	3	3	1	149	736
10h15	27	96	6	9	1	8	4	67	3	2	4	8	234	739
10h30	18	77	6	7	4	10	7	46	5	2	1	3	181	740
10h45	22	56	7	7	2	5	7	57	2	3	4	7	174	738
11h00	26	88	8	3	2	10	2	25	1	2	3	7	177	766
11h15	15	61	1	9	1	17	1	83	8	0	1	7	211	743
11h30	14	87	9	13	2	8	2	84	4	3	5	9	240	802
11h45	17	73	7	9	1	14	4	65	6	0	4	7	207	835
12h00	21	53	9	6	2	10	2	72	5	1	3	4	187	845
12h15	23	24	0	4	5	17	4	63	4	0	2	3	147	781
12h30	22	166	12	6	6	13	6	69	4	1	2	13	314	855
12h45	23	73	4	6	2	7	7	86	0	0	3	8	192	840
13h00	15	88	7	6	1	12	3	89	3	0	3	8	235	888
13h15	10	88	7	4	4	24	4	104	7	1	1	4	258	999
13h30	10	96	9	6	3	17	4	55	6	6	4	9	225	910
13h45	22	57	11	3	0	4	0	41	16	1	7	16	178	896
14h00	16	81	7	8	4	21	6	73	5	1	3	9	230	891
14h15	17	69	7	2	1	6	6	47	3	0	1	6	166	799
14h30	17	79	9	8	4	12	4	55	6	1	2	14	209	783
14h45	28	99	5	12	1	18	4	78	5	0	6	6	262	867
15h00	23	78	4	15	4	22	4	83	5	1	1	8	246	883
15h15	25	89	14	11	4	15	4	86	6	11	2	18	281	998
15h30	16	70	3	4	0	15	0	81	8	3	3	7	210	999
15h45	23	77	6	8	2	13	5	101	7	3	4	12	261	998
16h00	20	79	6	2	4	16	1	76	5	4	9	5	227	979
16h15	28	133	8	9	2	20	4	107	13	0	10	10	335	1033
16h30	35	107	5	10	4	21	5	98	3	3	20	3	311	1134
16h45	35	114	7	13	3	20	4	100	7	1	4	13	321	1194
17h00	51	166	10	14	3	24	6	100	8	2	4	11	377	1344
17h15	41	168	5	21	2	35	1	124	20	1	4	19	433	1442
17h30	56	211	9	13	2	13	2	130	15	0	3	21	410	1541
17h45	61	126	7	12	4	19	4	103	9	1	3	22	372	1592
18h00	35	108	8	7	2	12	2	72	7	2	2	14	271	1486
TOTAAL	1129	4397	321	436	157	832	223	3823	402	89	143	452	12404	

MIDDAGSPITS: VANAF 12h15 TOT 13h15 : DATUM: 08/11/2011

Sandkraalweg vanaf George SSK		901		43 %		Sandkraalweg vanaf Thembelethu		819		57 %		-<- RIGTINGSVERDELING	
386	^	30	515	30	415	70	56	13	22	70	51 %	^	(62 %)
		(5.825 %)	(80.5625 %)	(11.9658 %)			^	(14 %)				<-----	(24 %)
2 (4.5 %)	-----^	<--	v	-->	^	-----	^	-----	^	-----	^	-----	-----
9 (20 %)	-----^				^	-----	^	-----	^	-----	^	-----	-----
33 (75 %)	-----v				^	-----	^	-----	^	-----	^	-----	-----
Vuyani Ncamazanastraat vanaf L/kamp					^	-----	^	-----	^	-----	^	-----	-----
47 %					^	-----	^	-----	^	-----	^	-----	-----
50 <-----					^	-----	^	-----	^	-----	^	-----	-----
53 %					^	-----	^	-----	^	-----	^	-----	-----
(2.005730659 %)	-----^	7	328	349	^	-----	^	-----	^	-----	^	-----	-----
4.011461318 %	-----^	14	470	470	^	-----	^	-----	^	-----	^	-----	-----
43 %					^	-----	^	-----	^	-----	^	-----	-----
184					^	-----	^	-----	^	-----	^	-----	-----
Mainstraat vanaf Parkdene					^	-----	^	-----	^	-----	^	-----	-----

Sandkraalweg vanaf George SSK		1368		34 %		Sandkraalweg vanaf Thembelethu		1256		63 %		-<- RIGTINGSVERDELING	
467	^	31	901	31	661	209	56	13	22	209	66 %	^	(51 %)
		(3.441 %)	(73.3629 %)	(23.1964 %)			^	(14 %)				<-----	(6.4 %)
4 (4.5 %)	-----^	<--	v	-->	^	-----	^	-----	^	-----	^	-----	-----
89 (13 %)	-----^				^	-----	^	-----	^	-----	^	-----	-----
73 (82 %)	-----v				^	-----	^	-----	^	-----	^	-----	-----
Vuyani Ncamazanastraat vanaf L/kamp					^	-----	^	-----	^	-----	^	-----	-----
61 %					^	-----	^	-----	^	-----	^	-----	-----
58 <-----					^	-----	^	-----	^	-----	^	-----	-----
39 %					^	-----	^	-----	^	-----	^	-----	-----
(3.896103896 %)	-----^	18	392	462	^	-----	^	-----	^	-----	^	-----	-----
84.6485 %	-----^	52	794	794	^	-----	^	-----	^	-----	^	-----	-----
37 %					^	-----	^	-----	^	-----	^	-----	-----
413					^	-----	^	-----	^	-----	^	-----	-----
Mainstraat vanaf Parkdene					^	-----	^	-----	^	-----	^	-----	-----

ANNEXURE C

SIDRA RESULTS

- **SANDKRAAL ROAD / MAIN STREET, 2012, AM (signalized junction)**
- **SANDKRAAL ROAD / MAIN STREET 2012, PM (signalized junction)**

- **MAIN STREET / FILLING STATION, 2012, AM (priority / stop junction)**
- **MAIN STREET / FILLING STATION, 2012, PM (priority / stop junction)**

- **SANDKRAAL ROAD / MAIN STREET, 2017, AM (signalized junction)**
- **SANDKRAAL ROAD / MAIN STREET 2017, AM (signalized junction)**
- **WITH ADDITIONAL PHASE**
- **SANDKRAAL ROAD / MAIN STREET 2017, PM (signalized junction)**

- **MAIN STREET / FILLING STATION, 2017, AM (priority / stop junction)**
- **MAIN STREET / FILLING STATION , 2017, PM (priority / stop junction)**

MOVEMENT SUMMARY

Site: Sandkraal intersection 2012
AM

Four-way intersection with 2 & 3-lane approaches (Signals)

Signals - Fixed Time Cycle Time = 60 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow 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: Sandkraal from N2											
1	L	71	0.0	0.782	24.0	LOS C	20.5	143.6	0.88	0.97	38.4
2	T	706	0.0	0.782	15.8	LOS B	20.5	143.6	0.88	0.85	39.2
3	R	111	0.0	0.725	30.2	LOS C	2.9	20.6	0.77	0.90	32.7
Approach		887	0.0	0.782	18.2	LOS B	20.5	143.6	0.87	0.87	38.2
East: Main Street											
4	L	86	0.0	0.631	27.2	LOS C	8.5	59.4	0.90	0.85	34.6
5	T	44	0.0	0.631	19.0	LOS B	8.5	59.4	0.90	0.77	35.2
6	R	199	0.0	0.631	27.1	LOS C	8.5	59.4	0.90	0.84	34.6
Approach		329	0.0	0.631	26.0	LOS C	8.5	59.4	0.90	0.84	34.7
North: Sandkraal from George CDB											
7	L	145	0.0	0.156	17.0	LOS B	2.3	16.2	0.57	0.75	40.9
8	T	467	0.0	0.479	10.7	LOS B	9.1	63.6	0.70	0.61	44.0
9	R	38	0.0	0.191	32.2	LOS C	1.0	7.1	0.88	0.74	31.7
Approach		651	0.0	0.479	13.4	LOS B	9.1	63.6	0.68	0.65	42.3
West: Vuyani Street											
10	L	21	0.0	0.198	24.1	LOS C	1.9	13.4	0.75	0.77	36.3
11	T	15	0.0	0.198	15.9	LOS B	1.9	13.4	0.75	0.60	37.8
12	R	53	0.0	0.198	24.1	LOS C	1.9	13.4	0.75	0.78	36.3
Approach		88	0.0	0.198	22.7	LOS C	1.9	13.4	0.75	0.75	36.6
All Vehicles		1956	0.0	0.782	18.1	LOS B	20.5	143.6	0.81	0.79	38.7

Level of Service (LOS) Method: Delay (HCM 2000).

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 used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	53	21.7	LOS C	0.1	0.1	0.85	0.85
P3	Across E approach	53	10.2	LOS B	0.1	0.1	0.58	0.58
P5	Across N approach	53	24.3	LOS C	0.1	0.1	0.90	0.90
P7	Across W approach	53	10.2	LOS B	0.1	0.1	0.58	0.58
All Pedestrians		212	16.6	LOS B			0.73	0.73

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: Sandkraal intersection 2012
PM

Four-way intersection with 2 & 3-lane approaches (Signals)

Signals - Fixed Time Cycle Time = 60 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Sandkraal from N2											
1	L	20	0.0	0.447	18.7	LOS B	8.5	59.2	0.69	0.93	41.8
2	T	425	0.0	0.447	10.5	LOS B	8.5	59.2	0.69	0.60	44.1
3	R	63	0.0	0.501	31.5	LOS C	1.7	11.9	0.88	0.78	32.0
Approach		508	0.0	0.501	13.4	LOS B	8.5	59.2	0.71	0.63	42.1
East: Main Street											
4	L	71	0.0	0.306	24.6	LOS C	3.7	25.7	0.78	0.79	35.9
5	T	11	0.0	0.306	16.4	LOS B	3.7	25.7	0.78	0.64	37.1
6	R	83	0.0	0.306	24.5	LOS C	3.7	25.7	0.78	0.79	35.9
Approach		164	0.0	0.306	24.0	LOS C	3.7	25.7	0.78	0.78	36.0
North: Sandkraal from George CDB											
7	L	249	0.0	0.269	17.6	LOS B	4.2	29.7	0.61	0.77	40.4
8	T	717	0.0	0.735	13.8	LOS B	17.4	121.5	0.85	0.78	41.1
9	R	34	0.0	0.085	22.0	LOS C	0.7	4.7	0.68	0.73	37.3
Approach		1000	0.0	0.735	15.0	LOS B	17.4	121.5	0.79	0.78	40.8
West: Vuyani Street											
10	L	4	0.0	0.206	24.1	LOS C	2.1	14.6	0.75	0.77	36.3
11	T	14	0.0	0.206	15.9	LOS B	2.1	14.6	0.75	0.60	37.7
12	R	79	0.0	0.206	24.2	LOS C	2.1	14.6	0.75	0.78	36.2
Approach		97	0.0	0.206	23.0	LOS C	2.1	14.6	0.75	0.75	36.4
All Vehicles		1769	0.0	0.735	15.8	LOS B	17.4	121.5	0.76	0.74	40.4

Level of Service (LOS) Method: Delay (HCM 2000).

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 used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	53	21.7	LOS C	0.1	0.1	0.85	0.85
P3	Across E approach	53	10.2	LOS B	0.1	0.1	0.58	0.58
P5	Across N approach	53	24.3	LOS C	0.1	0.1	0.90	0.90
P7	Across W approach	53	10.2	LOS B	0.1	0.1	0.58	0.58
All Pedestrians		212	16.6	LOS B			0.73	0.73

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: Filling station stop 2012 AM

Three-way intersection with 2-lane major road (Stop control)
Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Filling station											
1	L	24	0.0	0.055	10.2	LOS B	0.2	1.4	0.45	0.84	19.9
3	R	20	0.0	0.055	10.1	LOS B	0.2	1.4	0.45	0.96	19.8
Approach		44	0.0	0.055	10.1	LOS B	0.2	1.4	0.45	0.90	19.8
East: Main Street											
4	L	32	0.0	0.175	8.2	LOS A	0.0	0.0	0.00	1.03	49.0
5	T	308	0.0	0.175	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		340	0.0	0.175	0.8	NA	0.0	0.0	0.00	0.10	58.8
West: Main Street											
11	T	244	0.0	0.125	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	24	0.0	0.032	9.5	LOS A	0.1	0.5	0.40	0.65	47.1
Approach		268	0.0	0.125	0.9	NA	0.1	0.5	0.04	0.06	58.6
All Vehicles		653	0.0	0.175	1.4	NA	0.2	1.4	0.05	0.13	57.3

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model used.

Processed: 02 April 2012 11:29:23 AM

SIDRA INTERSECTION 5.1.3.1990

Project: P:\1_Current Projects\VKE1154_C1356 TIA for filling station, Erf 11221, George\3_Working\3-6_Traffic

Counts\Filling Station.sip

8000113, VELA VKE CONSULTING ENGINEERS, FLOATING

Copyright © 2000-2011 Akcelik and Associates Pty Ltd

www.sidrasolutions.com

SIDRA
INTERSECTION

MOVEMENT SUMMARY

Site: Filling station stop 2012 PM

Three-way intersection with 2-lane major road (Stop control)
Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow 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: Filling station											
1	L	13	0.0	0.044	9.7	LOS A	0.2	1.1	0.36	0.80	20.1
3	R	24	0.0	0.044	9.7	LOS A	0.2	1.1	0.36	0.94	20.0
Approach		37	0.0	0.044	9.7	LOS A	0.2	1.1	0.36	0.89	20.1
East: Main Street											
4	L	15	0.0	0.086	8.2	LOS A	0.0	0.0	0.00	1.03	49.0
5	T	152	0.0	0.086	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		166	0.0	0.086	0.7	NA	0.0	0.0	0.00	0.09	58.8
West: Main Street											
11	T	296	0.0	0.152	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	31	0.0	0.037	8.9	LOS A	0.1	0.6	0.27	0.63	47.6
Approach		326	0.0	0.152	0.8	NA	0.1	0.6	0.03	0.06	58.6
All Vehicles		529	0.0	0.152	1.4	NA	0.2	1.1	0.04	0.13	57.3

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model used.

Processed: 02 April 2012 11:30:33 AM

SIDRA INTERSECTION 5.1.3.1990

Project: P:\1_Current Projects\WKE1154_C1356 TIA for filling station, Erf 11221, George\3_Working\3-6_Traffic

Counts\Filling Station.sip

8000113, VELA VKE CONSULTING ENGINEERS, FLOATING

Copyright © 2000-2011 Akcelik and Associates Pty Ltd

www.sidrasolutions.com

SIDRA
INTERSECTION

MOVEMENT SUMMARY

Site: Sandkraal intersection 2017
AM

Four-way intersection with 2 & 3-lane approaches (Signals)

Signals - Fixed Time Cycle Time = 90 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Sandkraal from N2											
1	L	82	0.0	0.761	22.3	LOS C	29.1	203.4	0.80	0.94	39.2
2	T	824	0.0	0.761	14.1	LOS B	29.1	203.4	0.80	0.73	40.6
3	R	123	0.0	1.000 ³	32.8	LOS C	3.6	25.3	0.95	0.82	31.4
Approach		1029	0.0	1.000	17.0	LOS B	29.1	203.4	0.82	0.76	39.1
East: Main Street											
4	L	100	0.0	0.889	55.7	LOS E	20.3	142.1	1.00	1.03	23.8
5	T	55	0.0	0.889	47.5	LOS D	20.3	142.1	1.00	1.03	23.9
6	R	231	0.0	0.889	55.6	LOS E	20.3	142.1	1.00	1.03	23.9
Approach		385	0.0	0.889	54.4	LOS D	20.3	142.1	1.00	1.03	23.9
North: Sandkraal from George CDB											
7	L	169	0.0	0.152	16.6	LOS B	3.2	22.6	0.47	0.74	41.2
8	T	542	0.0	0.463	10.6	LOS B	13.1	91.4	0.60	0.53	44.4
9	R	44	0.0	0.244	37.8	LOS D	1.6	11.3	0.82	0.77	29.3
Approach		756	0.0	0.463	13.5	LOS B	13.1	91.4	0.58	0.59	42.4
West: Vuyani Street											
10	L	24	0.0	0.317	36.0	LOS D	3.6	25.4	0.82	0.79	30.3
11	T	17	0.0	0.317	27.8	LOS C	3.6	25.4	0.82	0.67	31.1
12	R	61	0.0	0.317	36.1	LOS D	3.6	25.4	0.82	0.80	30.3
Approach		102	0.0	0.317	34.7	LOS C	3.6	25.4	0.82	0.78	30.4
All Vehicles		2273	0.0	1.000	23.0	LOS C	29.1	203.4	0.77	0.75	35.7

Level of Service (LOS) Method: Delay (HCM 2000).

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 used.

³ x = 1.00 due to short lane. Refer to the Lane Summary report for information about excess flow and related conditions.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	53	31.3	LOS D	0.1	0.1	0.83	0.83
P3	Across E approach	53	9.3	LOS A	0.1	0.1	0.46	0.46
P5	Across N approach	53	33.8	LOS D	0.1	0.1	0.87	0.87
P7	Across W approach	53	9.3	LOS A	0.1	0.1	0.46	0.46
All Pedestrians		212	20.9	LOS C			0.65	0.65

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: Sandkraal intersection 2017
AM with additional phase

Four-way intersection with 2 & 3-lane approaches (Signals)

Signals - Fixed Time Cycle Time = 70 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow 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: Sandkraal from N2											
1	L	82	0.0	0.836	27.5	LOS C	29.5	206.7	0.90	1.00	36.2
2	T	819	0.0	0.836	19.3	LOS B	29.5	206.7	0.90	0.91	36.8
3	R	128	0.0	0.659	23.8	LOS C	2.5	17.2	0.89	0.81	36.2
Approach		1029	0.0	0.836	20.5	LOS C	29.5	206.7	0.90	0.90	36.7
East: Main Street											
4	L	100	0.0	0.800	37.4	LOS D	13.9	97.3	0.98	0.95	29.8
5	T	55	0.0	0.800	29.2	LOS C	13.9	97.3	0.98	0.94	30.0
6	R	231	0.0	0.800	37.3	LOS D	13.9	97.3	0.98	0.95	29.8
Approach		385	0.0	0.800	36.2	LOS D	13.9	97.3	0.98	0.95	29.8
North: Sandkraal from George CDB											
7	L	169	0.0	0.266	26.3	LOS C	4.2	29.7	0.76	0.78	34.8
8	T	542	0.0	0.811	27.1	LOS C	19.0	133.1	0.97	0.95	32.6
9	R	44	0.0	0.274	37.6	LOS D	1.4	10.0	0.91	0.76	29.4
Approach		756	0.0	0.811	27.6	LOS C	19.0	133.1	0.92	0.90	32.9
West: Vuyani Street											
10	L	24	0.0	0.270	28.2	LOS C	2.7	19.0	0.79	0.79	34.0
11	T	17	0.0	0.270	20.1	LOS C	2.7	19.0	0.79	0.64	35.1
12	R	61	0.0	0.270	28.3	LOS C	2.7	19.0	0.79	0.79	34.0
Approach		102	0.0	0.270	26.9	LOS C	2.7	19.0	0.79	0.76	34.1
All Vehicles		2273	0.0	0.836	25.8	LOS C	29.5	206.7	0.92	0.91	33.9

Level of Service (LOS) Method: Delay (HCM 2000).

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 used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	53	24.9	LOS C	0.1	0.1	0.84	0.84
P3	Across E approach	53	18.6	LOS B	0.1	0.1	0.73	0.73
P5	Across N approach	53	27.5	LOS C	0.1	0.1	0.89	0.89
P7	Across W approach	53	18.6	LOS B	0.1	0.1	0.73	0.73
All Pedestrians		212	22.4	LOS C			0.80	0.80

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: Sandkraal intersection 2017
PM

Four-way intersection with 2 & 3-lane approaches (Signals)

Signals - Fixed Time Cycle Time = 60 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Sandkraal from N2											
1	L	23	0.0	0.519	19.2	LOS B	10.3	72.2	0.72	0.93	41.5
2	T	494	0.0	0.519	11.0	LOS B	10.3	72.2	0.72	0.63	43.6
3	R	74	0.0	0.631	37.9	LOS D	2.3	15.8	0.96	0.83	29.3
Approach		591	0.0	0.631	14.7	LOS B	10.3	72.2	0.75	0.67	41.0
East: Main Street											
4	L	79	0.0	0.357	25.0	LOS C	4.3	30.4	0.80	0.80	35.7
5	T	14	0.0	0.357	16.8	LOS B	4.3	30.4	0.80	0.66	36.9
6	R	98	0.0	0.357	24.9	LOS C	4.3	30.4	0.80	0.80	35.7
Approach		191	0.0	0.357	24.3	LOS C	4.3	30.4	0.80	0.79	35.8
North: Sandkraal from George CDB											
7	L	289	0.0	0.312	17.8	LOS B	5.1	35.4	0.63	0.78	40.2
8	T	832	0.0	0.853	21.3	LOS C	26.1	182.7	0.94	0.99	35.8
9	R	39	0.0	0.113	23.7	LOS C	0.8	5.8	0.72	0.74	36.2
Approach		1160	0.0	0.853	20.5	LOS C	26.1	182.7	0.86	0.93	36.8
West: Vuyani Street											
10	L	5	0.0	0.245	24.3	LOS C	2.5	17.3	0.76	0.78	36.1
11	T	16	0.0	0.245	16.2	LOS B	2.5	17.3	0.76	0.62	37.5
12	R	92	0.0	0.245	24.4	LOS C	2.5	17.3	0.76	0.79	36.1
Approach		113	0.0	0.245	23.3	LOS C	2.5	17.3	0.76	0.76	36.3
All Vehicles		2054	0.0	0.853	19.3	LOS B	26.1	182.7	0.82	0.83	37.8

Level of Service (LOS) Method: Delay (HCM 2000).

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 used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	53	21.7	LOS C	0.1	0.1	0.85	0.85
P3	Across E approach	53	10.2	LOS B	0.1	0.1	0.58	0.58
P5	Across N approach	53	24.3	LOS C	0.1	0.1	0.90	0.90
P7	Across W approach	53	10.2	LOS B	0.1	0.1	0.58	0.58
All Pedestrians		212	16.6	LOS B			0.73	0.73

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: Filling station stop 2017 AM

Three-way intersection with 2-lane major road (Stop control)
Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Filling station											
1	L	28	0.0	0.071	10.7	LOS B	0.3	1.8	0.49	0.86	19.3
3	R	23	0.0	0.071	10.7	LOS B	0.3	1.8	0.49	0.99	19.3
Approach		52	0.0	0.071	10.7	LOS B	0.3	1.8	0.49	0.92	19.3
East: Main Street											
4	L	37	0.0	0.203	8.2	LOS A	0.0	0.0	0.00	1.03	49.0
5	T	358	0.0	0.203	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		395	0.0	0.203	0.8	NA	0.0	0.0	0.00	0.10	58.8
West: Main Street											
11	T	283	0.0	0.145	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	28	0.0	0.038	9.8	LOS A	0.1	0.7	0.44	0.67	47.0
Approach		312	0.0	0.145	0.9	NA	0.1	0.7	0.04	0.06	58.5
All Vehicles		758	0.0	0.203	1.5	NA	0.3	1.8	0.05	0.14	57.3

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model used.

Processed: 02 April 2012 12:02:54 PM

SIDRA INTERSECTION 5.1.3.1990

Project: P:\1_Current Projects\VKE1154_C1356 TIA for filling station, Erf 11221, George\3_Working\3-6_Traffic

Counts\Filling Station.sip

8000113, VELA VKE CONSULTING ENGINEERS, FLOATING

Copyright © 2000-2011 Akcelik and Associates Pty Ltd

www.sidrasolutions.com

SIDRA
INTERSECTION

MOVEMENT SUMMARY

Site: Filling station stop 2017 PM

Three-way intersection with 2-lane major road (Stop control)
Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Filling station											
1	L	15	0.0	0.056	10.2	LOS B	0.2	1.4	0.40	0.80	19.7
3	R	28	0.0	0.056	10.1	LOS B	0.2	1.4	0.40	0.96	19.6
Approach		43	0.0	0.056	10.2	LOS B	0.2	1.4	0.40	0.90	19.6
East: Main Street											
4	L	17	0.0	0.099	8.2	LOS A	0.0	0.0	0.00	1.03	49.0
5	T	176	0.0	0.099	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		193	0.0	0.099	0.7	NA	0.0	0.0	0.00	0.09	58.8
West: Main Street											
11	T	343	0.0	0.176	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	36	0.0	0.044	9.0	LOS A	0.1	0.7	0.29	0.63	47.5
Approach		379	0.0	0.176	0.9	NA	0.1	0.7	0.03	0.06	58.6
All Vehicles		615	0.0	0.176	1.5	NA	0.2	1.4	0.04	0.13	57.2

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model used.

Processed: 02 April 2012 12:03:44 PM

SIDRA INTERSECTION 5.1.3.1990

Project: P:\1_Current Projects\VKE1154_C1356 TIA for filling station, Erf 11221, George\3_Working\3-6_Traffic Counts\Filling Station.sip

8000113, VELA VKE CONSULTING ENGINEERS, FLOATING

Copyright © 2000-2011 Akcelik and Associates Pty Ltd

www.sidrasolutions.com

SIDRA 
INTERSECTION



SMEC



VELA VKE
Part of the SMEC Group

18 Progress Street
George 6520, South Africa
(PO Box 10633, George 6530, South Africa)
T +27 44 670 6029
F +27 44 670 6086
www.smec.com | www.velavke.co.za

29 August 2012

VKE1154.C1356/5647
H MAART/da

Mr Claude Madell
George Municipality
P.O. Box 19
GEORGE
6530

Dear Sir

**TRAFFIC IMPACT STUDY FOR FILLING STATION DEVELOPMENT ON ERF 11221,
GEORGE**

Please receive the above Traffic Impact Statement dated March 2012 for your comment/approval.

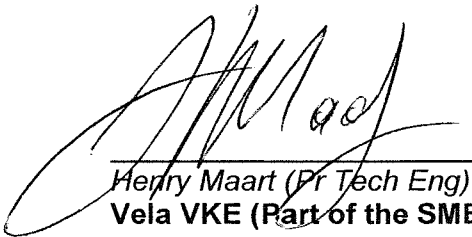
Also find attached a letter dated 6 July 2012 from the Western Cape Government (Transport and Public Works).

This letter states that Main Street is a Proclaimed Provincial Minor Road 6886.

Options are listed under points 4 and 5 of the letter, that George Municipality should follow to rectify the current situation.

We trust that this information will be sufficient for you to address this matter.

Kind regards



Henry Maart (Pr Tech Eng)
Vela VKE (Part of the SMEC Group)