

# Transport Impact Assessment

## ***Springbok Hotel Erf 5206, Springbok***

***Northern Cape***

***March 2018***



5th Floor

Imperial Terraces

Carl Cronje Drive

Tyger Waterfront

Bellville, 7530

(021) 914 6211 (T)

e-mail: [mail@itsglobal.co.za](mailto:mail@itsglobal.co.za)

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**SUMMARY SHEET**

Report Type	Transport Impact Assessment
Title	Springbok Hotel Erf 5206, Springbok
Location	Northern Cape
Client	Civil Sense Consulting
Reference Number	ITS 3909
Project Team	Lynne Pretorius, Pr.Eng Alwyn Muller
Contact Details	Tel: 021 914 6211
Date	March 2018
Report Status	First Draft
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## TABLE OF CONTENTS

### Report - Summary Table

#### Appendices

Appendix A: Figures

Appendix B: Tables

Appendix C: Photographs

#### List of Figures

Figure 1: Locality Plan

Figure 2: Site Development Plan

Figure 3: Existing 2017 Traffic Conditions

Figure 4: 2022 Background Traffic Conditions

Figure 5: Estimated Trip Generation and Trip Distribution

Figure 6: 2022 Total Traffic Conditions

#### List of Tables

Table 1: 2017 Existing Traffic Conditions

Table 2: 2022 Background Traffic Conditions

Table 3: 2022 Total Traffic Conditions

#### Abbreviations

AMP – Access Management Plan

CM – Critical Movement

HCM – Highway Capacity Manual

LOS – Level of Service

MOE – Measures of Efficiency

MR – Provincial Main Road

RAP&G – Road Access Policy and Guidelines

SARTSM – South African Roads Traffic Signs Manual

SDF – Spatial Development Framework

SDP – Sight Development Plan

SSD – Shoulder Sight Distance

TIS - Traffic Impact Statement

V/C – Volume to Capacity Ratio

<b>Transport Impact Assessment</b> <b>Springbok Hotel Erf 5206, Springbok, Northern Cape</b>	
1. Purpose of Study	A developer is intending to develop a hotel with associated facilities on erf 5206, Springbok in the Northern Cape. The purpose of the Transport Impact Investigation (TIA) is to assess the impact of the proposed development on the surrounding road network and to recommend appropriate mitigation measures, if required.
2. Locality	Erf 5206, Springbok, Northern Cape Description: Erf 5206 is located north of Springbok Caravan Park. Refer to <b>Figure 1, Appendix A</b> for a Locality Plan.
3. Land Use	Proposed land uses and extents of the development are as follows: <ul style="list-style-type: none"> <li>• Hotel – 100 Rooms</li> <li>• Conference Centre – 300 seats</li> </ul> Refer to <b>Figure 2, Appendix A</b> for the Site Development Plan (SDP).
4. Surrounding land use	Currently only the Springbok Caravan Park is located in the vicinity of the proposed development.  The developer has indicated that more development is envisaged adjacent to the proposed Hotel and Conference Centre. The initial indications are that it could comprise a residential development, a hospital, a business node (retail and commercial land use). However, a Development Framework is not available for this proposed development yet, but the proposed Hotel and Conference Centre are the first of the envisaged developments to be released.
5. Access(es)	<i>Existing:</i> The Erf currently has access from a gravel road that intersects with the R355, adjacent to the Springbok Caravan Park access. Refer to <b>Photo 1, Appendix C</b> . The gravel road is located 15 m from the access to the Springbok Caravan Park intersection, measured c/c.  <i>Proposed:</i> <ul style="list-style-type: none"> <li>• Further developments are proposed surrounding the Proposed Conference Centre and Hotel. However, an overall Development Frameworks is not available. A very high-level access management plan has been prepared to guide the proposal for access to the Proposed Conference Centre and Hotel. <b>Refer to Figure 3 in Annexure A.</b></li> <li>• It is proposed that the existing access along the R355, adjacent to the Springbok Caravan Park, as well as the existing access to the Caravan</li> </ul>

<p>5. Access(es) (Continued)</p>	<p>Park, be closed.</p> <ul style="list-style-type: none"> <li>• A new access on the R355 is proposed 191m north to create a new priority-controlled intersection (new proposed Link Road/ R355 intersection) with the R355 having priority. The alignment of the new Link Road must still be determined and must function and be designed as a Class 4 Street. This new Link Road intersection will be located approximately 700m from the intersection of Kokerboom Road and the R55. This intersection could also be signalised in future if the adjacent developments are implemented and signalisation is warranted.</li> <li>• A north-south side street is further proposed intersecting with this new Link Road at 220m from the proposed R355/ Link Road intersection. This north-south side street is proposed to provide access to further developments in the area; the proposed Business in Zones 5 and 6, the Proposed Hotel and Conference Centre, etc.</li> <li>• Erf 5206 will gain access from the north-south side street a further 60m south of the Link Road intersection. The current SDP for the Proposed Hotel and Conference Centre must be amended to reflect this.</li> <li>• The Springbok Caravan Park will require access from a new temporary gravel road proposed. This new gravel road will run from the proposed north-south side street further west and connect with the existing gravel road. The developer of the Springbok Hotel and Conference Centre will have to relocate the Springbok Caravan Park access at their expense. This is being proposed only at this stage and must be negotiated with the current land owner and the approval authorities. In future, if the Caravan Park site is retained with its current land use, or re-developed, access to the site should be via the proposed north-south side street.</li> </ul> <p>The proposed access locations in <b>Figure3 in Annexure C</b> conforms to the access spacing guidelines provided in the Road Access Guideline Manual (RAG) for a suburban environment and the Access Management Guideline.</p> <p>The Shoulder Sight Distance is also appropriate and in excess of the 200m required in terms of the recommendations of TRH17. Refer to <b>Figure 4, Appendix A.</b></p>
<p>6. Existing Roadways in Site Vicinity</p>	<p>The R355 consist of a single carriageway, approximately 3.7 meter travel lanes per direction, with gravel shoulders along both sides of the road.</p> <p><b>Photos 1 – 2, Appendix C</b> shows the existing cross section of the road in the vicinity of the site.</p>

7. Analyses Hours	Weekday AM Peak Hour (between 06:30 – 08:30) Weekday PM Peak Hour (between and 16:00 – 18:00)												
8. Scenarios Analysed	2017 Existing traffic conditions 2022 Background traffic conditions (existing traffic volumes escalated with a traffic growth rate as discussed in Section 10). 2022 Total traffic conditions (background traffic plus the development trips).												
9. Study Intersections (existing control)	<table border="1"> <thead> <tr> <th data-bbox="459 613 507 645"><u>Nr.</u></th> <th data-bbox="560 613 807 645"><u>Intersection Name</u></th> <th data-bbox="1083 613 1257 645"><u>Control Type</u></th> </tr> </thead> <tbody> <tr> <td data-bbox="459 674 496 705">#1</td> <td data-bbox="560 674 858 705">N7 / Western Terminal</td> <td data-bbox="1046 674 1246 705">Priority Control</td> </tr> <tr> <td data-bbox="459 719 496 750">#2</td> <td data-bbox="560 719 847 750">N7 / Eastern Terminal</td> <td data-bbox="1046 719 1246 750">Priority Control</td> </tr> <tr> <td data-bbox="459 763 496 795">#3</td> <td data-bbox="560 763 895 795">R355 / Kokerboom Street</td> <td data-bbox="1046 763 1206 795">All-way stop</td> </tr> </tbody> </table> <p data-bbox="459 815 1490 891">Refer to <b>Figure 5 (Appendix A)</b> for the Lane Configuration and Traffic Control Devices.</p>	<u>Nr.</u>	<u>Intersection Name</u>	<u>Control Type</u>	#1	N7 / Western Terminal	Priority Control	#2	N7 / Eastern Terminal	Priority Control	#3	R355 / Kokerboom Street	All-way stop
<u>Nr.</u>	<u>Intersection Name</u>	<u>Control Type</u>											
#1	N7 / Western Terminal	Priority Control											
#2	N7 / Eastern Terminal	Priority Control											
#3	R355 / Kokerboom Street	All-way stop											
10. Existing Intersection Operations	<p data-bbox="459 922 1490 999">The capacity analysis is based on the existing lane configuration as shown in <b>Figure 5 (Appendix A)</b>.</p> <p data-bbox="459 1028 1490 1104">All the study intersections operate at acceptable levels of service during the weekday a.m. and p.m. peak hours.</p> <p data-bbox="459 1133 1490 1209">Refer to <b>Figure 5 (Appendix A)</b> for a summary of the MOE's. The results of the intersection analysis are also summarised in <b>Table 1 (Appendix B)</b>.</p>												
11. Background Traffic Conditions	<p data-bbox="459 1270 1490 1480"><b>Growth Rate:</b> A growth rate of 3 percent per annum was applied over a period of 5 years to the existing traffic volumes to account for the growth in traffic volumes along the transport network. However, this does not necessarily account for the envisaged development adjacent to the proposed Hotel and Conference Centre.</p> <p data-bbox="459 1509 1490 1675">It is recommended that an overall Development Framework be developed with the supporting TIA that will then provide a better indication of expected future growth in traffic. In the absence of such information, a 3% growth per annum was assumed.</p> <p data-bbox="459 1704 1490 1825">The analyses indicate that all the study intersections are expected to still operate at acceptable levels of service with the existing geometry during the weekday a.m. and p.m. peak hours.</p> <p data-bbox="459 1854 1490 1930">Refer to <b>Figure 6 (Appendix A)</b> for a summary of the MOE's. The results of the intersection analysis are also summarised in <b>Table 2 (Appendix B)</b>.</p>												

12. Trip Generation Rates	<p>Trip generation rates were obtained from the South African Trip Data Manual, TMH17.</p> <ul style="list-style-type: none"> <li>• Hotel (COTO 251) <ul style="list-style-type: none"> <li>– AM Peak Hour           0.50 trips/100m<sup>2</sup> GLA</li> <li>– PM Peak Hour           0.50 trips/100m<sup>2</sup> GLA</li> </ul> </li> <li>• Conference Centre (COTO 780) <ul style="list-style-type: none"> <li>– AM Peak Hour           2.10 trips/100m<sup>2</sup> GLA</li> <li>– PM Peak Hour           2.10 trips/100m<sup>2</sup> GLA</li> </ul> </li> </ul>												
13. Trip Distribution	<p>It is expected that the trips generated by the Hotel would originate from outlying areas; i.e. Cape Town, Namibia, Upington and that the trips generated for the Conference Centre would originate from the surrounding areas; i.e. Springbok and OKiep.</p> <p>Refer to <b>Figure 7, Appendix A</b> for the trip distribution.</p>												
14. Development Trips	<p>Based on the recommended trip generation rates as summarised above, the proposed development of Erf 5206 is expected to generate the following peak hour vehicle trips:</p> <table border="1" data-bbox="448 1043 1209 1189"> <thead> <tr> <th>Peak Hour</th> <th>In</th> <th>Out</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>Weekday a.m.</td> <td>149</td> <td>36</td> <td>185</td> </tr> <tr> <td>Weekday p.m.</td> <td>33</td> <td>153</td> <td>186</td> </tr> </tbody> </table> <p>Refer to <b>Figure 5, Appendix A</b> for the assignment of the development trips.</p>	Peak Hour	In	Out	Total	Weekday a.m.	149	36	185	Weekday p.m.	33	153	186
Peak Hour	In	Out	Total										
Weekday a.m.	149	36	185										
Weekday p.m.	33	153	186										
15. Total Traffic Conditions	<p>The capacity analysis is based on the existing lane configuration as shown in <b>Figure 6 (Appendix A)</b>.</p> <p>For the 2022 total traffic conditions, the estimated development trips were added to the 2022 background traffic volumes. The analysis results indicate that all intersections can still be expected to operate satisfactorily for this traffic scenario. No further intersection improvements are required.</p> <p>Refer to <b>Figure 8, Appendix A</b> for a summary of the MOE's. The results of the intersection analysis are also summarised in <b>Table 3, Appendix B</b>.</p>												
16. NMT	<p><i>Existing Facilities:</i> There are no sidewalks located along the R355 in the vicinity of the proposed development.</p> <p>It can be expected that some Hotel and Conference Centre employees will walk to/from the CBD and residential areas within Springbok. However, these expected pedestrian volumes are expected to not be significant at this stage. It could well increase in the future with the implementation of the adjacent developments proposed.</p>												

<p>16. NMT (Continued)</p>	<p><i>Proposed Facilities:</i> As part of the proposed Hotel and Conference Centre development it is proposed that</p> <p>Sidewalks be provided</p> <ul style="list-style-type: none"> <li>• Along the frontage of the Hotel precinct along both sides of the new Link Road between the R355 and the north-south side street, as well as</li> <li>• Along the north-south side street from the Link Road to the Hotel access.</li> </ul>												
<p>17. Public Transport</p>	<p><i>Existing Facilities:</i> Currently no public transport facilities exist close to or at the site.</p> <p>It is proposed that</p> <ul style="list-style-type: none"> <li>• Public transport embayments be provided at the access to the Hotel and Conference Centre and</li> <li>• Along the new Link Road at the Hospital Access and at the intersection of the new Link Road and the north-south street. This is only required when the other adjacent developments are being constructed.</li> </ul>												
<p>18. Parking</p>	<p>The parking standards in of the City of Cape Town and the National Department of Transport were reviewed and the following parking rates are recommended. Also refer to the parking calculations in <b>Table 4 in Annexure B.</b></p> <ul style="list-style-type: none"> <li>• Hotel <table border="0" data-bbox="459 1317 1235 1397"> <thead> <tr> <th>Rate</th> <th>Extend</th> <th>Bays Required</th> </tr> </thead> <tbody> <tr> <td>0.75 bays per room plus 20</td> <td>100 rooms</td> <td>95 bays</td> </tr> </tbody> </table> </li> <li>• Conference Centre <table border="0" data-bbox="459 1473 1235 1554"> <thead> <tr> <th>Rate</th> <th>Extend</th> <th>Bays Required</th> </tr> </thead> <tbody> <tr> <td>6 bays per 10 seats</td> <td>300 seats</td> <td>180 bays</td> </tr> </tbody> </table> </li> </ul> <p>Based on the SDP a total of 78 parking bays are provided. Accordingly, insufficient parking is provided. It is recommended that the parking provision should be negotiated with the Nama Koi Municipality.</p>	Rate	Extend	Bays Required	0.75 bays per room plus 20	100 rooms	95 bays	Rate	Extend	Bays Required	6 bays per 10 seats	300 seats	180 bays
Rate	Extend	Bays Required											
0.75 bays per room plus 20	100 rooms	95 bays											
Rate	Extend	Bays Required											
6 bays per 10 seats	300 seats	180 bays											
<p>19. Conclusion &amp; Recommendations</p>	<p>This study investigated the expected transport impacts on the surrounding road network, due to the proposed Springbok Hotel and Conference Development on Erf 5206. The development includes hotel space (100 rooms) and conference space (300 seats).</p> <p><b><u>Overall network and access planning</u></b></p> <ul style="list-style-type: none"> <li>• Further developments are proposed surrounding the Proposed</li> </ul>												



19. Conclusion &  
Recommendations  
(Continued)

Conference Centre and Hotel, but an overall Development Framework is not available. A very high-level access management plan has been prepared to guide the proposal for access to the Proposed Conference Centre and Hotel. It is recommended that an overall TIA be undertaken for the larger development proposals to assess and finalise roads network proposals, access proposals and the impact of additional traffic on the surrounding road network.

**Access proposals:**

- It is proposed that the existing access along the R355, adjacent to the Springbok Caravan Park, as well as the existing access to the Caravan Park, be closed.
- A new access on the R355 is proposed 191m north to create a new priority-controlled intersection (new proposed Link Road/ R355 intersection) with the R355 having priority. This intersection could also be signalised in future if the adjacent developments are implemented and signalisation is warranted.
- A north-south side street is further proposed intersecting with this new Link Road at 220m from the proposed R355/ Link Road intersection.
- Erf 5206 will gain access from the north-south side street a further 60m south of the Link Road intersection. The current SDP for the Proposed Hotel and Conference Centre must be amended to reflect this.
- The Springbok Caravan Park will require access from a new temporary gravel road proposed. The developer of the Springbok Hotel and Conference Centre will have to relocate the Springbok Caravan Park access at their expense. This is being proposed only at this stage and must be negotiated with the current land owner and the approval authorities.

**Transport Impact**

- The proposed development is expected to generate approximately 185 trips during both weekday peak hours respectively.
- 2017 Existing Traffic Conditions - All existing study intersections are operating at acceptable levels of service.
- 2022 Background Traffic Conditions - All existing study intersections are operating at acceptable levels of service.
- 2022 Total Traffic Conditions - All existing study intersections are operating at acceptable levels of service.

19 Conclusion &  
Recommendations  
(Continued)

- NMT - It is recommended that sidewalks be provided as follows:
  - Along the frontage of the Hotel precinct along both sides of the new Link Road between the R355 and the north-south side street, as well as
  - Along the north-south side street from the Link Road to the Hotel access. .
- Public Transport Improvements - It is proposed that public transport embayments be provided at the access to the Hotel and Conference Centre.
- Parking - Based on the SDP a total of 78 parking bays are provided. Accordingly, insufficient parking is provided. It is recommended that the parking provision should be negotiated with the Nama Koi Municipality.

**Recommendation**

It is our recommendation that the findings of this TIA be accepted and that the development proposal be accepted subject to the following:

- Access proposals be as set out above.
- Construction of public transport embayments at the Hotel and Conference Centre access location.
- Sidewalks be provided as set out above.
- Applicable parking rates be negotiated with the local authority and the SDP be amended to reflect the agreed parking requirements.
- Negotiations be undertaken between the developer of the Springbok Hotel and Conference and the municipality and the affected land owner, for the responsibility of the re-alignment of the access road for the Springbok Caravan Park.

TIA be undertaken for larger development proposal that assesses roads masterplanning, access management and impact of additional traffic on the surrounding road network.

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- Department of Transport, Guidelines for Traffic Impact Studies, Report No. PR 93/645, Pretoria, 1995.
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- Department of Transport, Parking Standards, Report number PG3/85, Final Report, November 1985
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- Department of Transport, Technical Recommendations for Highways, Geometric Design of Rural Roads, TRH17, 1988.

# Annexure A

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## Figures

### List of Figures

Figure 1: Locality Plan

Figure 2: Site Development Plan

Figure 3: Proposed Surrounding Developments and Development Accesses

Figure 4: Shoulder Sight Distances

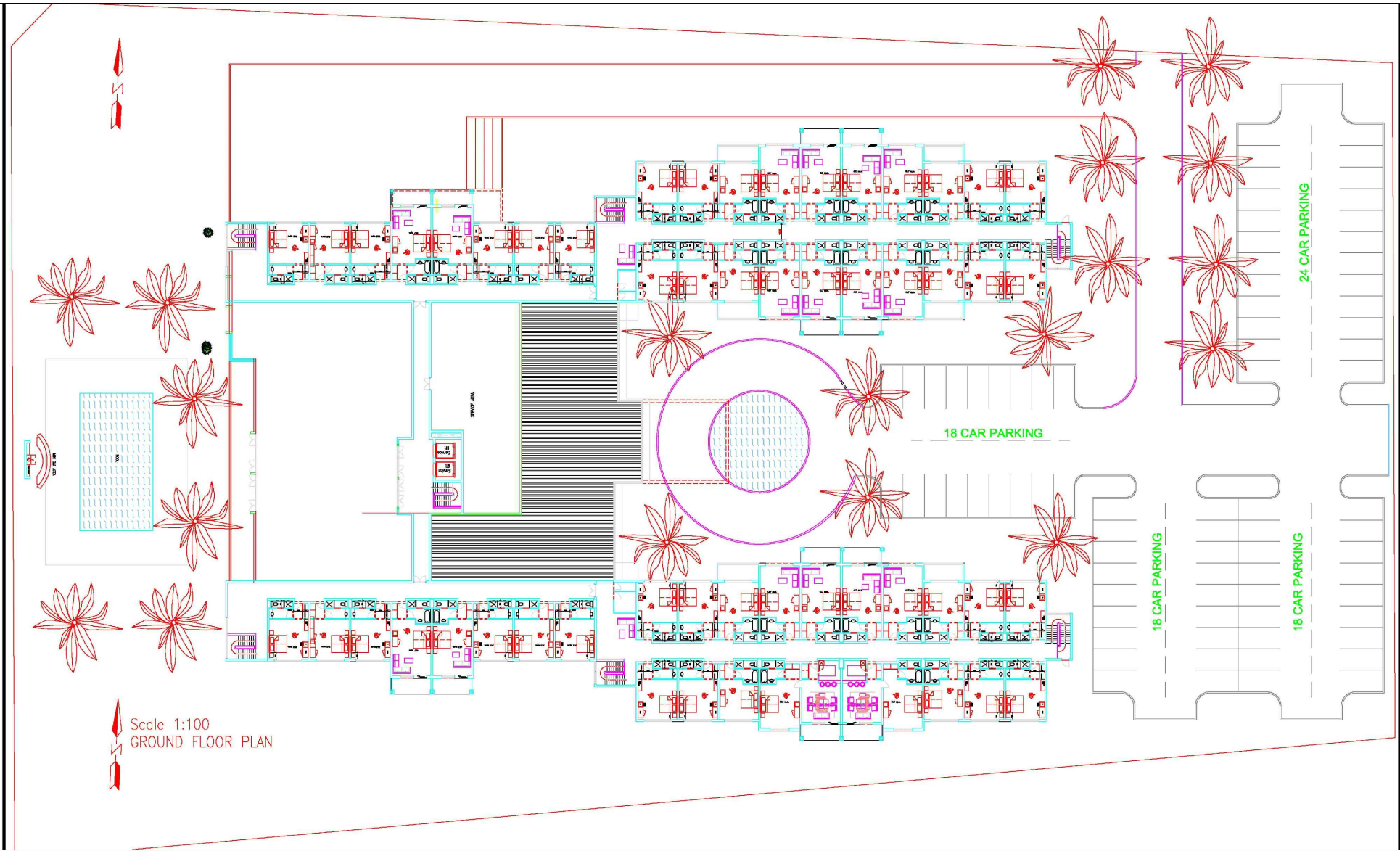
Figure 5: Existing 2017 Traffic Conditions

Figure 5: 2022 Background Traffic Conditions

Figure 6: Estimated Trip Generation and Trip Distribution

Figure 7: 2022 Total Traffic Conditions





PROPOSED NEW HOTEL DEVELOPMENT IN SPRINGBOK , NORTHERN CAPE FOR THREE CITIES GROUP

S P R I N G B O K



scale 1:100  
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name colour-plan

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SCHEMATIC



PROJECT:

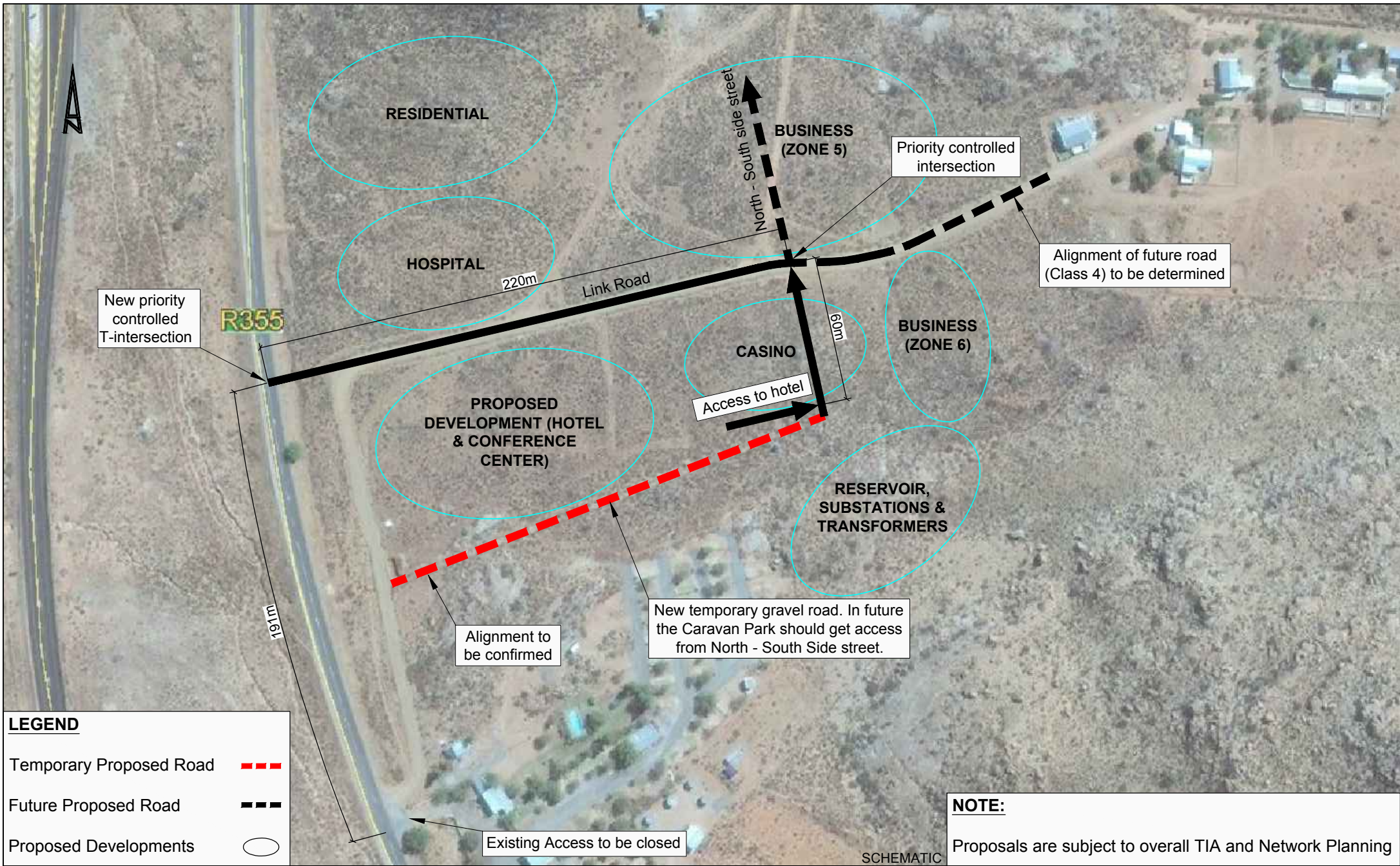
SPRINGBOK HOTEL ERF 5206, SPRINGBOK

FIGURE:

SITE DEVELOPMENT PLAN

NUMBER:

02



**LEGEND**

- Temporary Proposed Road - - -
- Future Proposed Road - - -
- Proposed Developments ○

**NOTE:**

Proposals are subject to overall TIA and Network Planning

<p>PROJECT:</p> <p style="text-align: center;"><b>SPRINGBOK HOTEL ERF 5206, SPRINGBOK</b></p>	<p>FIGURE:</p> <p style="text-align: center;"><b>PROPOSED SURROUNDING DEVELOPMENTS AND DEVELOPMENT ACCESS</b></p>	<p>NUMBER:</p> <p style="text-align: center;"><b>03</b></p>
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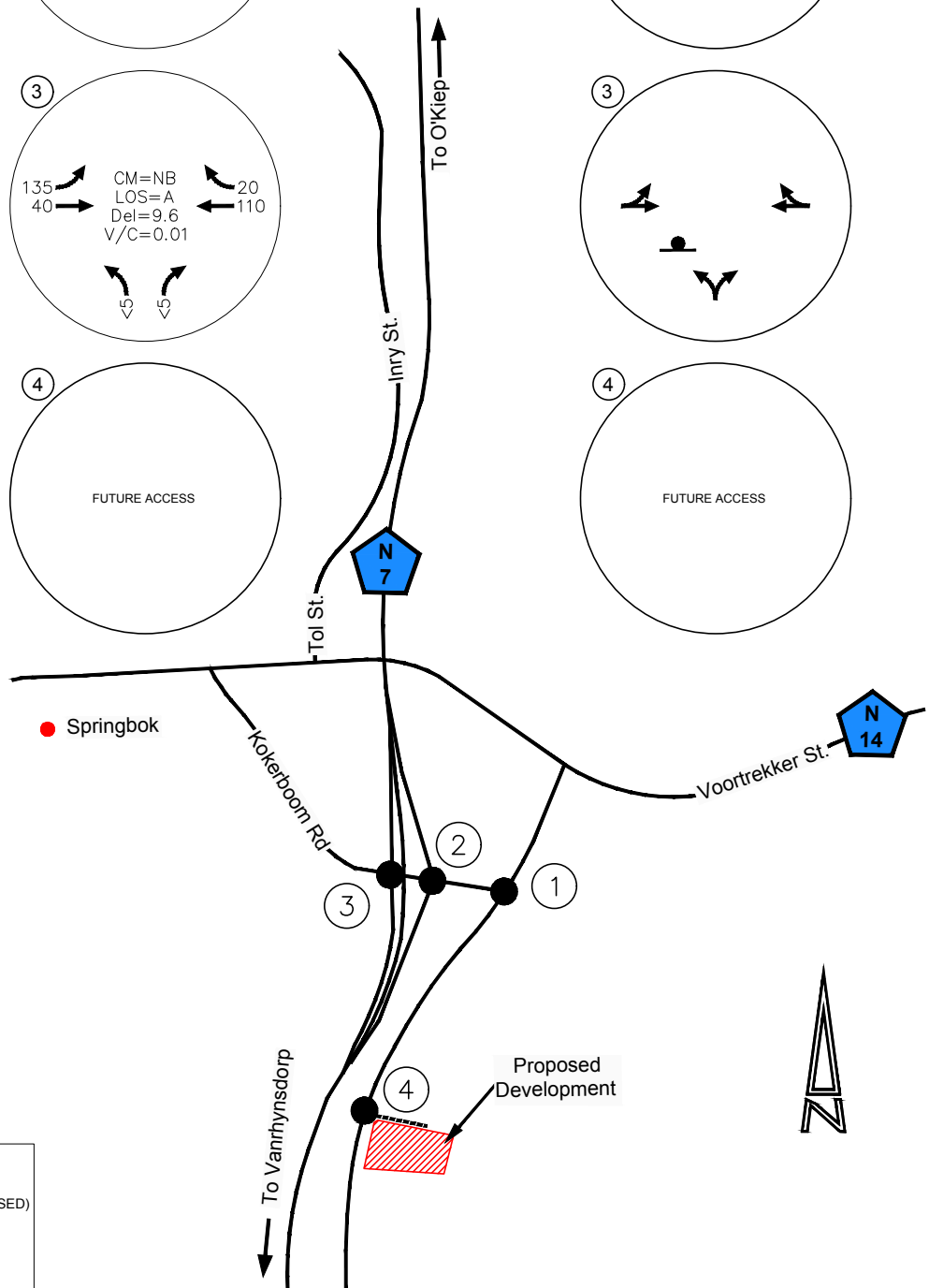
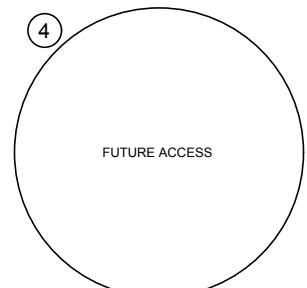
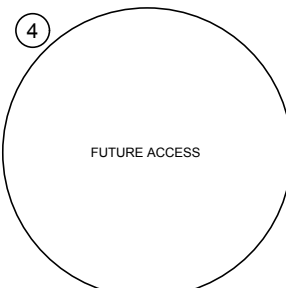
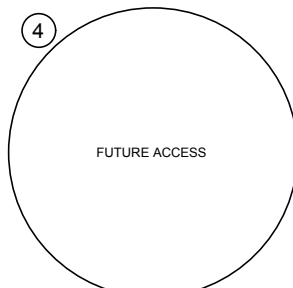
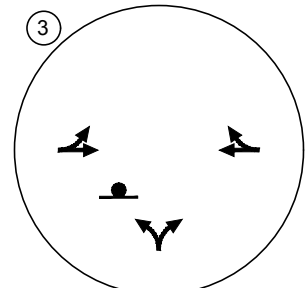
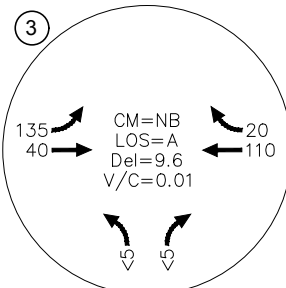
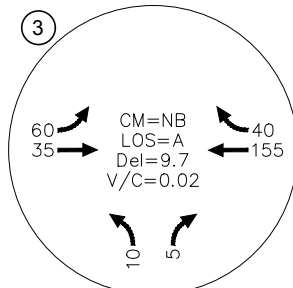
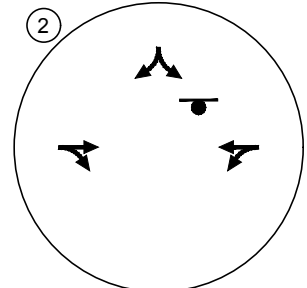
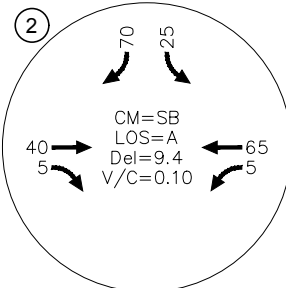
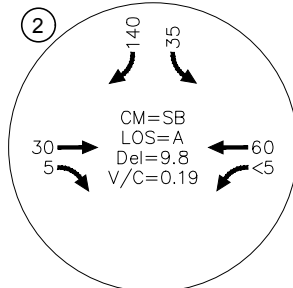
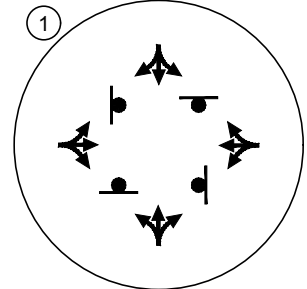
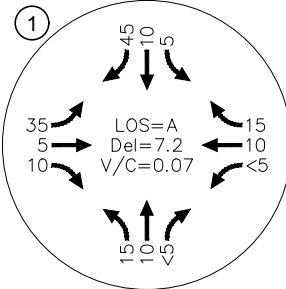
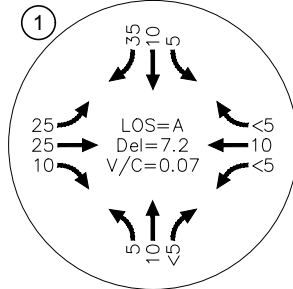




**A.M. PEAK HOUR**

**P.M. PEAK HOUR**

**GEOMETRY**



**LEGEND**

- STOP/ YIELD CONTROL
- TRAFFIC SIGNAL

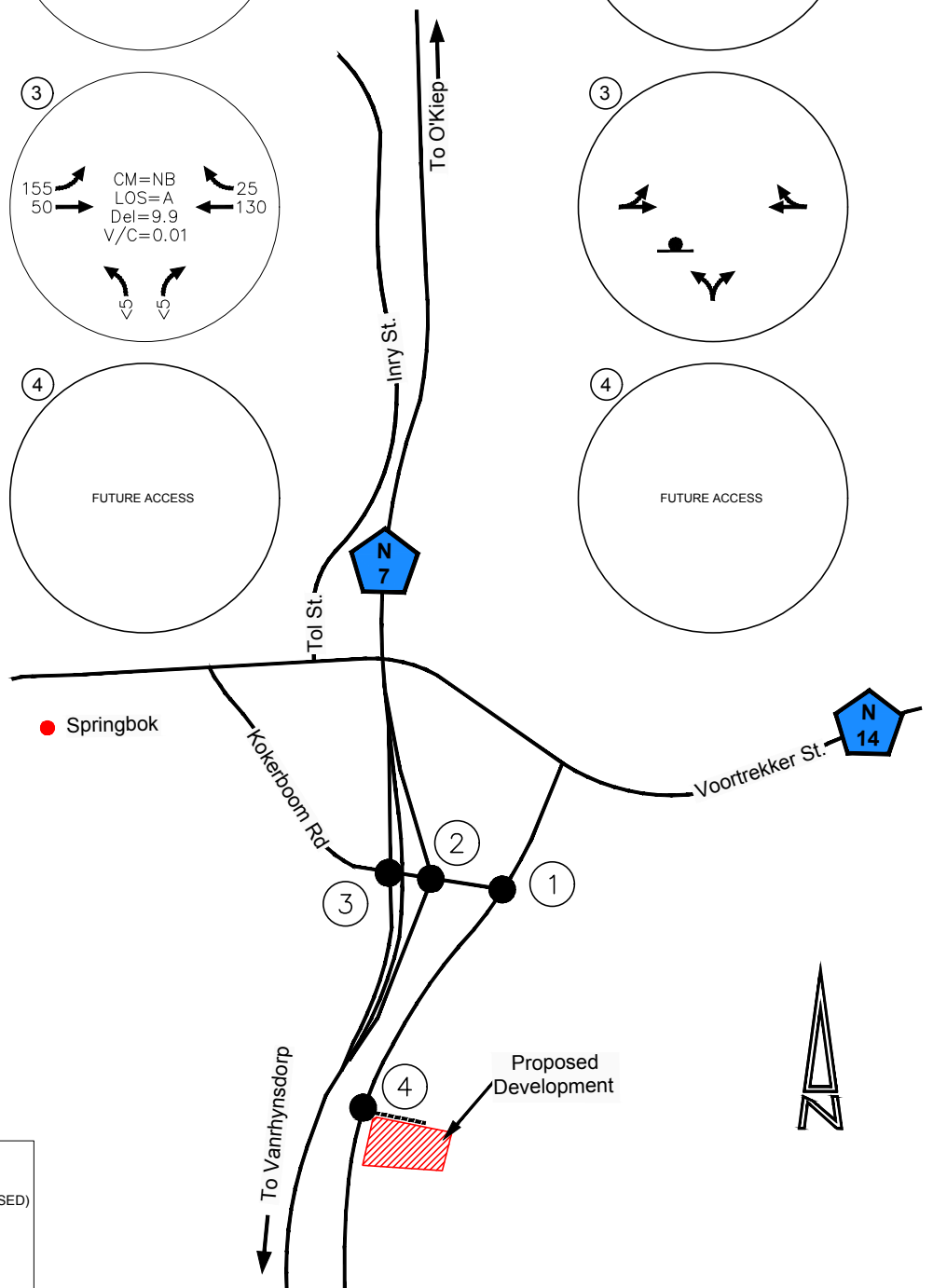
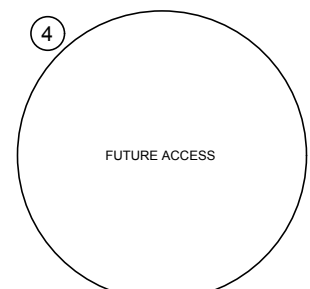
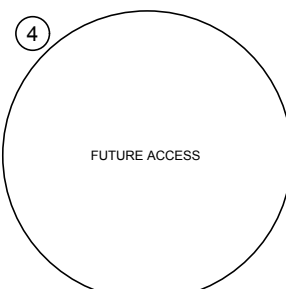
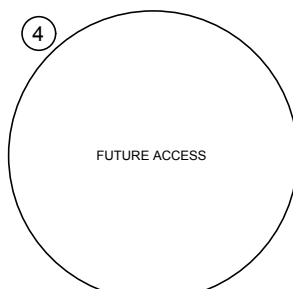
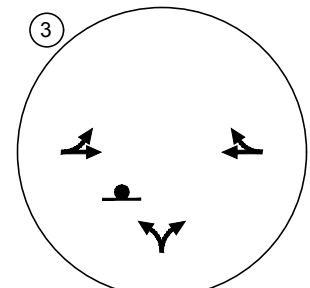
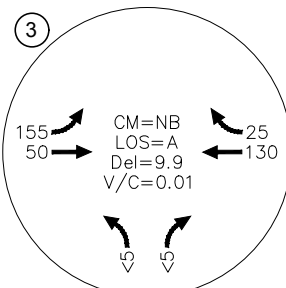
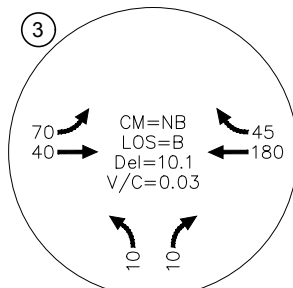
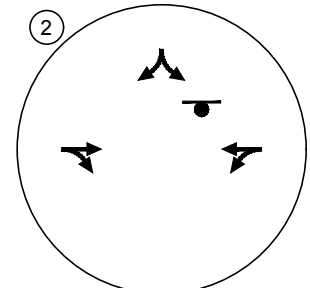
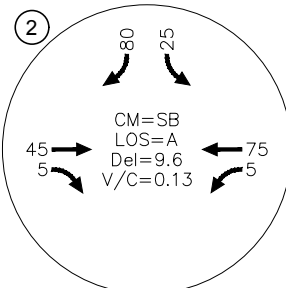
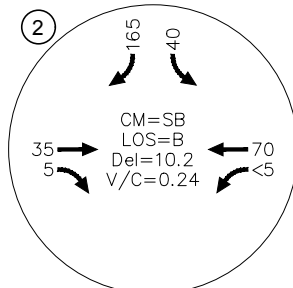
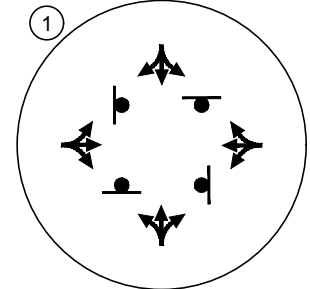
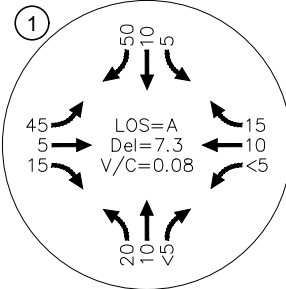
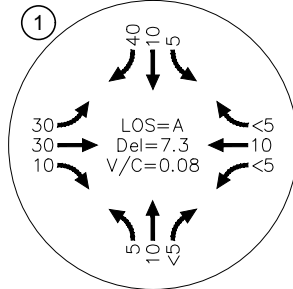
CM = CRITICAL MOVEMENT (UNSIGNALLISED)  
 LOS = INTERSECTION LEVEL OF SERVICE (SIGNALISED) /  
 CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALLISED)  
 Del = INTERSECTION AVERAGE DELAY (SIGNALISED) /  
 CRITICAL MOVEMENT DELAY UNSIGNALISED  
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO



**A.M. PEAK HOUR**

**P.M. PEAK HOUR**

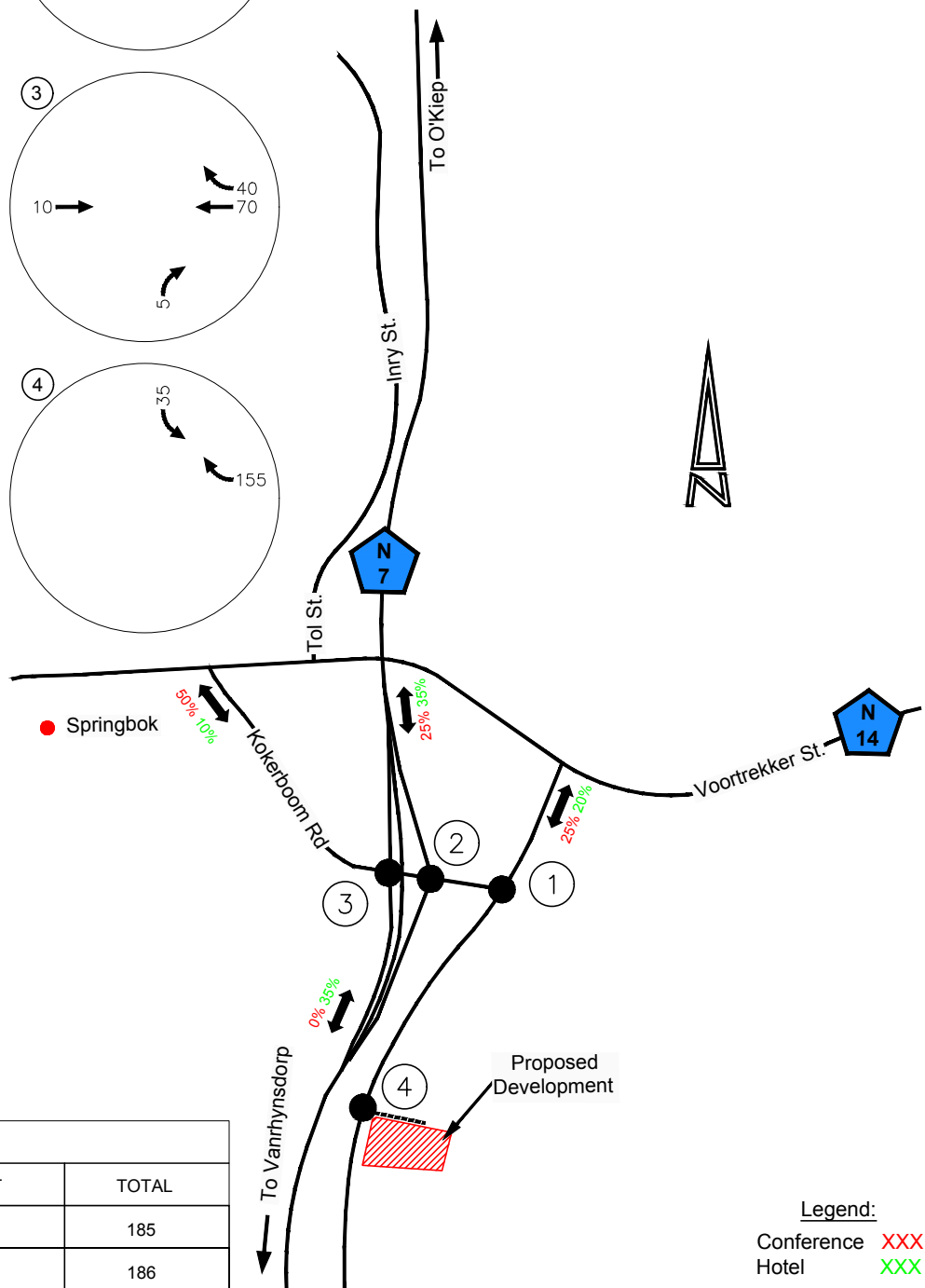
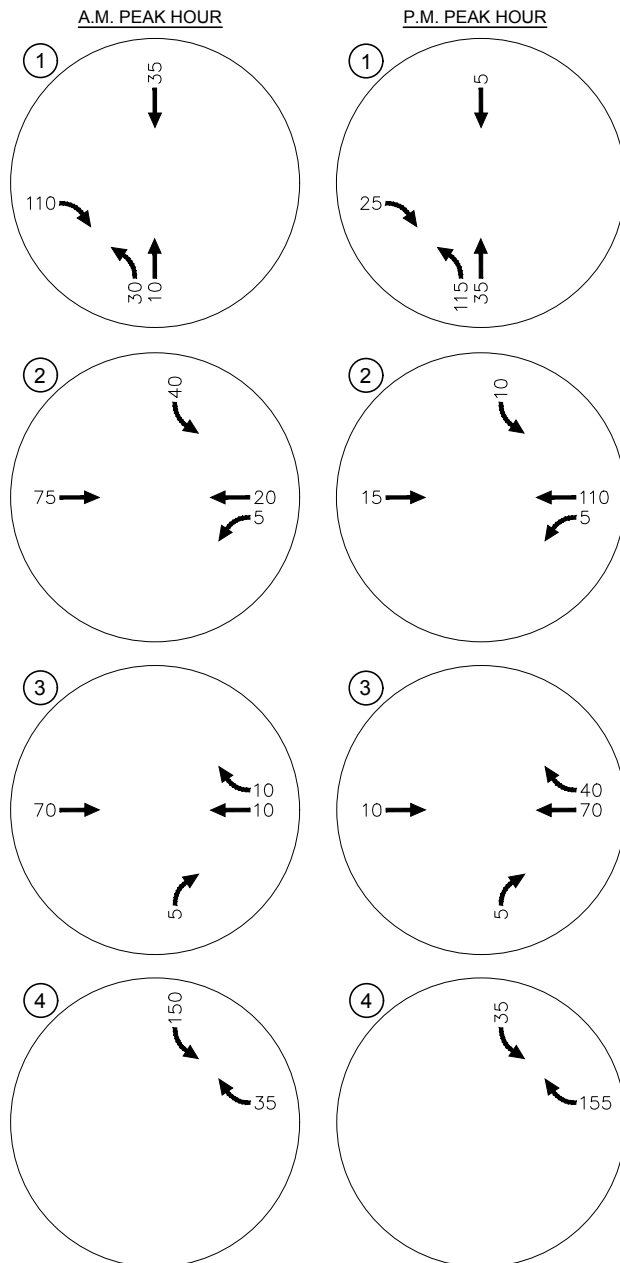
**GEOMETRY**



LEGEND	
	STOP/ YIELD CONTROL
	TRAFFIC SIGNAL

CM = CRITICAL MOVEMENT (UNSIGNALISED)  
 LOS = INTERSECTION LEVEL OF SERVICE (SIGNALISED) /  
 CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALISED)  
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 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO





TRIP GENERATION			
PEAK HOUR	IN	OUT	TOTAL
AM	149	36	185
PM	33	153	186

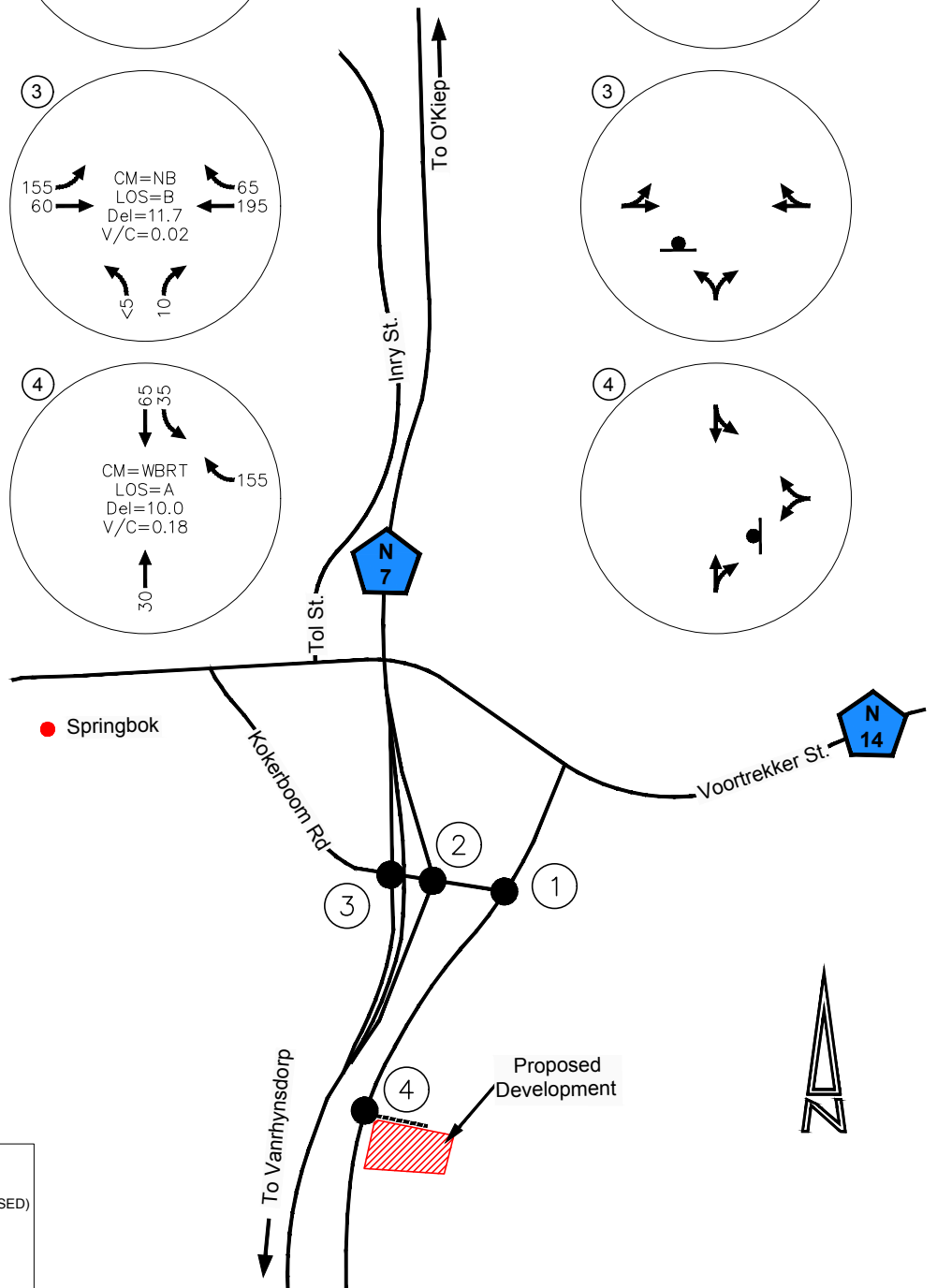
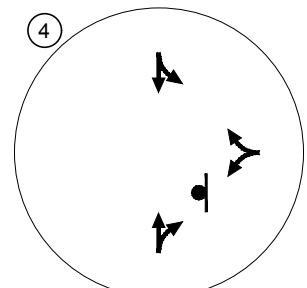
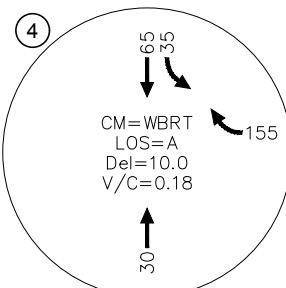
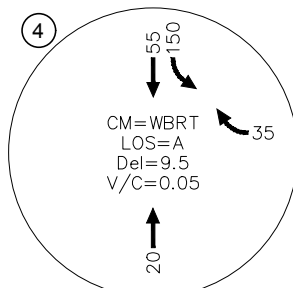
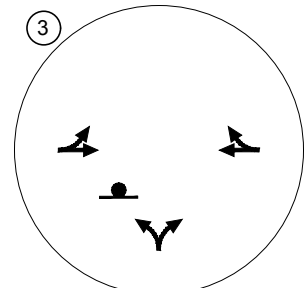
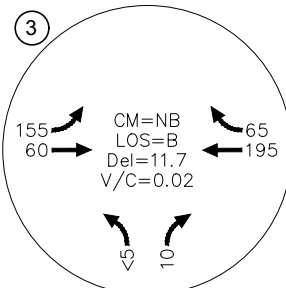
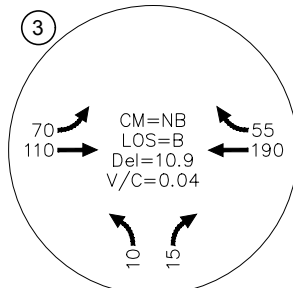
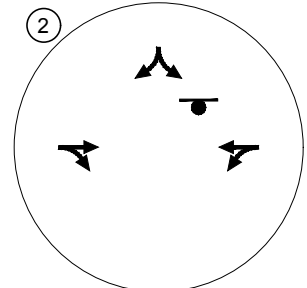
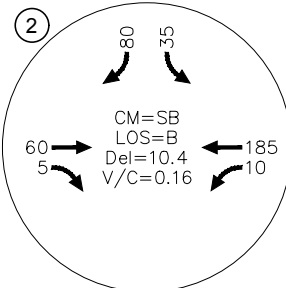
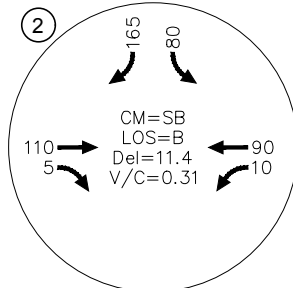
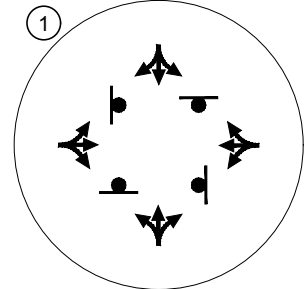
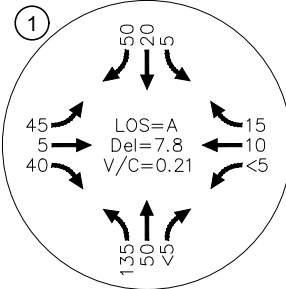
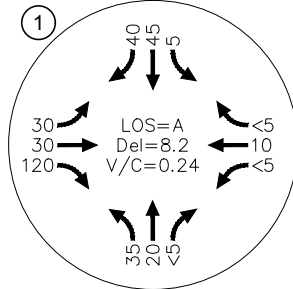
**Legend:**  
 Conference XXX  
 Hotel XXX



**A.M. PEAK HOUR**

**P.M. PEAK HOUR**

**GEOMETRY**



LEGEND	
	STOP/ YIELD CONTROL
	TRAFFIC SIGNAL

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## Annexure B

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### Tables

Table 1: 2017 Existing Traffic Conditions

#	Intersection	Weekday AM Peak Hour			Weekday PM Peak Hour		
		LOS	Delay	V/C	LOS	Delay	V/C
1	R355/Kokerboom Street	A	7.2	0.07	A	7.2	0.07
2	N7/Eastern Terminal	A	9.8	0.19	A	9.4	0.10
3	N7/Western Terminal	A	9.7	0.02	A	9.6	0.01

Table 2: 2022 Background Traffic Conditions

#	Intersection	Weekday AM Peak Hour			Weekday PM Peak Hour		
		LOS	Delay	V/C	LOS	Delay	V/C
1	R355/Kokerboom Street	A	7.3	0.08	A	7.3	0.08
2	N7/Eastern Terminal	B	10.2	0.24	A	9.6	0.10
3	N7/Western Terminal	B	10.1	0.03	A	9.9	0.01

Table 3: 2022 Total Traffic Conditions

#	Intersection	Weekday AM Peak Hour			Weekday PM Peak Hour		
		LOS	Delay	V/C	LOS	Delay	V/C
1	R355/Kokerboom Street	A	8.2	0.24	A	7.6	0.11
2	N7/Eastern Terminal	B	11.2	0.32	A	9.8	0.14
3	N7/Western Terminal	B	11.4	0.12	B	10.6	0.02
4	R355/Proposed Access	A	9.4	0.01	A	9.3	0.05

LOS – Level-of-Service, Delay in seconds per vehicle, V/C – Volume-to-capacity Ratio.

Data for Two-way Stop is for Critical Movement

Data for Signals & All-Way Stop is average of all approaches

Table 4: Parking Calculations

<b>Springbok Hotel and Conference Centre Parking Requirements</b>							
Land Use	Scope		Rate		Source	No of bays required	No of bays provided
Hotel	100	rooms	0.75	per bedroom + 20 bays	CoCT, Standard Parking area	95	
Conference Centre	300	seats	6	bays per 10 seats	CoCT, Standard Parking area	180	
					<b>TOTAL</b>	<b>275</b>	<b>78</b>
					<b>Shortfal</b>	<b>197</b>	
Land Use	Scope		Rate		Source	No of bays required	No of bays provided
Hotel	100	rooms	1	per bedroom + 20 bays	DoT Parking Standards	120	
Conference Centre	300	seats	6	bays per 10 seats	DoT Parking Standards	180	
					<b>TOTAL</b>	<b>300</b>	<b>78</b>
					<b>Shortfal</b>	<b>222</b>	

Annexure C

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Photographs





**Photo 1: Access of Caravan Park and the existing road to the proposed development**



**Photo 2: Northbound view from existing access**



**Photo 3: Southbound view from existing access**



**Photo 4: Location of the proposed access along the R355**