Long Island Trading 44 (Pty) Ltd

Proposed development of Herolds Bay Estate
on Portion 7 of the Farm Buffelsfontein, Herolds Bay

TRAFFIC IMPACT STUDY

MARCH 2020

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1 INTRODUCTION

1.1 Background

Element Consulting Engineers (ECE) has been appointed by Long Island Trading 44 (Pty) Ltd, the developers of Herolds Bay Estate, to undertake a traffic impact study for the proposed development of Herolds Bay Estate on Portion 7 of the Farm Buffelsfontein, Herolds Bay.

1.2 Proposed development

The project proposes the development of the following:

- 102 single residential erven
- 68 group housing units
- Filling station
- 750m^2 convenience centre
- 250m^2 restaurant
- 300m^2 offices

1.3 Locality, access and layout

The proposed development is located on a portion of Portion 7 of the farm Buffelsfontein, Herolds Bay. The site is located directly north-east of Herolds Bay town and directly west of the existing Oubaai Golf Estate. The site is bounded to the north and west by farmland.

Current and proposed access to the residential development is obtained via Oubaai Main Road from the existing traffic circle at the entrance to Oubaai Golf Estate.

Proposed access to the filling station is proposed directly from Oubaai Main Road at a point approximately 78m east of the intersection with the R404. This point is currently also servicing as access to the private development to the south.

The location is indicated on Figure 1 in relation to Oubaai Golf Estate in a western direction and Herolds Bay in a south-western direction.

Figure 1: Locality and access

The proposed site development plan (SDP) is indicated in the figures below and is attached as addendum.

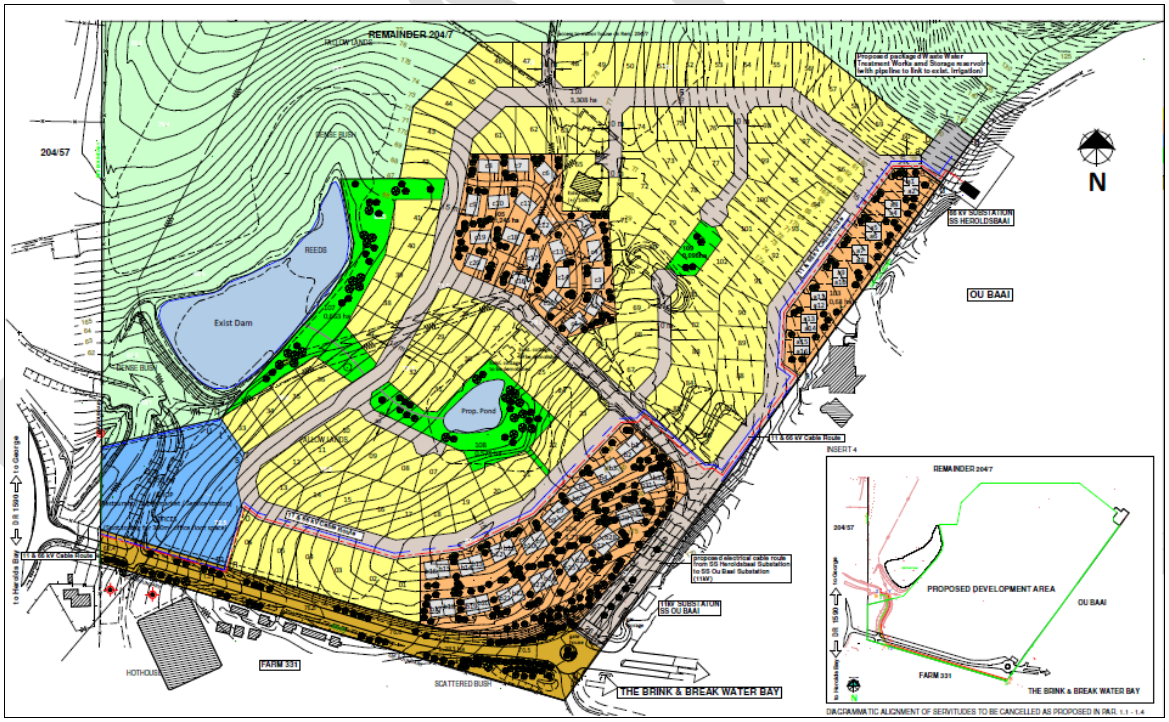


Figure 2: Site Development Plan: Residential Estate

Figure 3: Site Development Plan: Commercial Centre

It is of importance to note, from a traffic impact study perspective, that no thoroughfare may be provided between the boundaries of the commercial site and the residential development. Pedestrian access may be provided at this point.

1.4 Other developments

A number of developments are located adjacent and/or in close proximity to the study area. The extent of these developments and approved rights were studied as input into this report. Residential construction is ongoing at most of these estates and is expected to continue in the foreseeable future. The following developments were considered as background to the report:

- Oubaai Golf Estate – east of the traffic circle, shared circle
- Breakwater Bay Eco Estate – south of the traffic circle, shared circle
- The Brink Eco Estate – south of the traffic circle, shared circle
- Denneseerus – south of the commercial development, shared intersection

1.5 Purpose of the report

The purpose of the report is to assess the traffic impact of the proposed development on the adjacent road network. The following will be discussed and addressed in the report:

- Description of the development
- Locality, layout and access
- Existing and future background traffic conditions
- Trip generation and distribution
- Total future traffic conditions
- Traffic impact ito capacity analysis
- Infrastructure upgrades required (if any)
- Discussion of salient issues

1.6 Extent of analysis

The traffic impact study of the proposed development, proposed road configuration alterations as well as the other developments mentioned, were evaluated for the intersections affected by the development as well as the road upgrades.

Current and proposed access to the residential development is obtained via Oubaai Main Road from the existing traffic circle at the entrance to Oubaai Golf Estate.

Proposed access to the filling station and commercial centre is proposed directly from Oubaai Main Road at a point approximately 78m east of the intersection with the R404.

The intersections analysed for the traffic impact study were the following:

- Intersection 1: Traffic circle at the dead-end of Oubaai Main Road, shared with Oubaai Golf estate, Breakwater Bay Eco Estate & The Brink Eco Estate;
- Intersection 2: Proposed access to commercial site, shared intersection with Denneseerus;
- Intersection 3: T-Junction R404 / Oubaai Main Road.

The impact of the proposed development was evaluated for both the weekday morning and afternoon peak hours. The assessment years are for the base year 2020 and horizon year 2025.

2 TRIP GENERATION

2.1 Trip generation

Trip generation rates used in the report were obtained from the "South African Trip Data Manual" Version 1.01 September 2013 (TMH 17) as well as the "South African Trip Generation Rates" guideline document of June 1995 where necessary. The following trip generation rates were used to calculate trip generation during the peak hour of the adjacent road network:

- Residential: Single Dwelling Units (Land use code 210)
  Rate of 1.0 trips / unit for both AM and PM peak hours with a 25:75 (AM) and 70:30 (PM) directional split.

- Residential: Townhouses (Land use code 210)
  Rate of 0.85 trips / unit for both AM and PM peak hours with a 25:75 (AM) and 70:30 (PM) directional split.

- Commercial: Filling Station (Land use code 844 - SATGR)
  Rate of 3% of adjacent road network plus additional 16% new trips with a 50:50 directional split for both the weekday AM and PM peak hour periods.

- Commercial: Shopping Centre (Land use code 820)
  Rate of 0.6 trips / 100 sqm GLA with a 65:35 directional split for the peak hour period.

- Commercial: Restaurant (Land use code 932)
  Rate of 8.0 trips / 100 sqm GLA with a 65:35 directional split for the peak hour period.

- Commercial: Offices (Land use code 710)
  Rate of 2.1 trips / 100 sqm GLA for both AM and PM peak hours with an 85:15 (AM) and 20:80 (PM) directional split.

The estate is a good example of a mixed-use development and it is expected that estate residents will liberally utilize in-house facilities rather than venture outside the estate. It is

also expected that estate residents will utilize non-motorised transport to reach destinations within the estate rather than venture outside the estate.

Reduction factors may hence be applied to the number of new trips generated due to the following:

- Mixed use development (TMH 17 Table 3.2)
- Holiday and retirement homes (Southern Cape)
- Work-from-home (more prominent in Southern Cape)
- Work elsewhere, family in estate (more prominent in Southern Cape)
- Business zone development for- and used by internal residents.

The trip generation volumes are calculated in the following tables in line with the trip generation rates and reduction factors discussed above:

TMH 17 Classification	Peak Hour	Units / GLA	Trip Reduction Factor	Trip Generation Rate	Split		Trips		Sub Total
					In	Out	In	Out	
210 Single Dwelling Units	AM	102	10%	1	25%	75%	23	69	92
	PM		10%	1	70%	30%	64	28	92
231 Townhouses	AM	68	15%	0.85	25%	75%	12	37	49
	PM		15%	0.85	70%	30%	34	15	49
Total Trips	AM						35	106	141
	PM						99	42	141

Table 1: Trip Generation: Residential Estate

TMH 17 Classification	Peak Hour	Units / GLA	Trip Reduction Factor	Trip Generation Rate	Split		Trips		Sub Total
					In	Out	In	Out	
844 (SATGR) Filling Station	AM	358 Adjcnt Trips	0%	0.0056	50%	50%	1	1	2
	PM		0%	0.0056	50%	50%	1	1	2
820 Convenience Centre	AM	750 sqm	0%	0.6/100sqm	65%	35%	3	2	5
	PM		0%	0.6/100sqm	35%	65%	2	3	5
932 Restaurant	AM	250 sqm	0%	0/100sqm	-	-	0	0	0
	PM		0%	8/100sqm	65%	35%	13	7	20
710 Offices	AM	300 sqm	0%	2.1/100sqm	85%	15%	5	1	6
	PM		0%	2.1/100sqm	20%	80%	1	5	6
Total Trips	AM						9	4	13
	PM						17	16	33

Table 2: Trip Generation: Commercial Development (New Trips)

TMH 17 Classification	Peak Hour	Units / GLA	Trip Reduction Factor	Deflection & Passer-by Rate	Split		Trips		Sub Total
					In	Out	In	Out	
844 (SATGR) Filling Station	AM	358 Adjcnt Trips	0%	0.03	50%	50%	5	5	10
	PM		0%	0.03	50%	50%	5	5	10
820 Convenience Centre	AM	750 sqm	0%	0.36/100 sqm	65%	35%	2	1	3
	PM		0%	0.36/100 sqm	35%	65%	1	2	3
932 Restaurant	AM	250 sqm	0%	0/100sqm	-	-	0	0	0
	PM		0%	2.4/100sqm	65%	35%	4	2	6
Total Trips	AM						7	6	13
	PM						10	9	19

Table 3: Deflected and Passer-by Trips: Commercial Development

2.2 Trip distribution and assignment

It is anticipated that traffic that will be generated by the proposed development will be distributed on the road network as follows:

Residential Estate:

- All access to the development will be via the sole access from Oubaai Main Road at the circle;
- 82% of traffic developed will be attracted to George;
- 4% of traffic developed will be attracted to Herolds Bay;
- 5% of traffic developed will be attracted to the commercial centre;

- 1% of traffic development will be attracted to Breakwater Bay Eco Estate and The Brink Eco Estate;
- 4% of traffic development will distribute towards Oubaai Golf Estate;
- 2% of traffic development will distribute directly to Oubaai Golf Estate via the pedestrian access and golf cart parking area. This traffic will not be directed through the public road network;
- 2% of traffic development will distribute directly to the commercial centre via the pedestrian access and golf cart parking area. This traffic will not be directed through the public road network;

The trip distribution is indicated diagrammatically in the figure below:

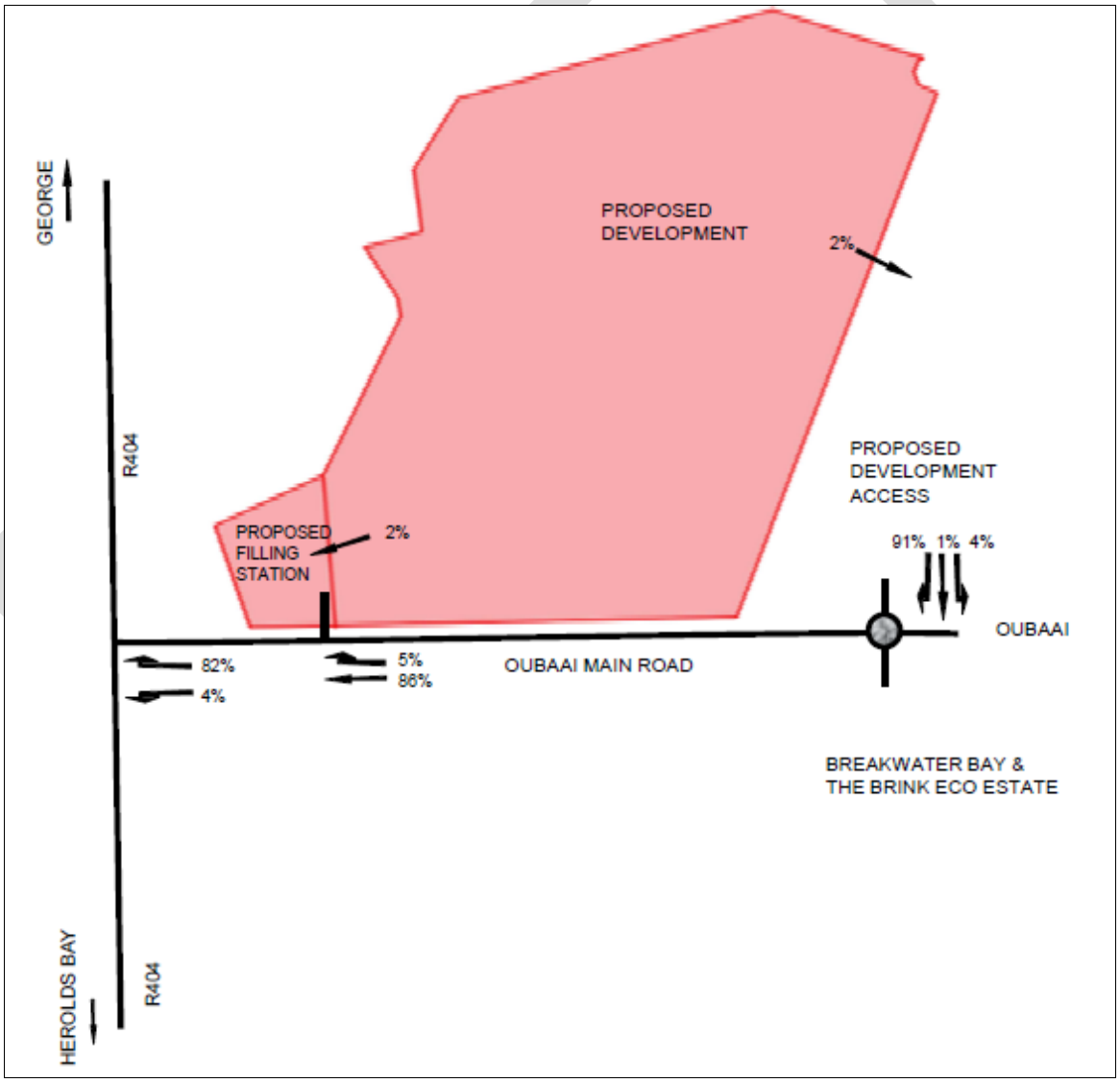


Figure 4: Trip distribution & assignment: Residential Estate

Commercial Centre:

- All access to the development will be via the sole access from Oubaai Main Road at a point approximately 78m east of the intersection with the R404;
- 45% of traffic will be attracted from Herolds Bay;
- 10% of traffic will be attracted from the direction of George;
- 12% of traffic will be attracted from Herolds Bay Estate;
- 27% of traffic will be attracted from Oubaai Golf Estate;
- 6% of traffic will be attracted from Breakwater Bay Eco Estate and The Brink Eco Estate.

The trip distribution is indicated diagrammatically in the figure below:

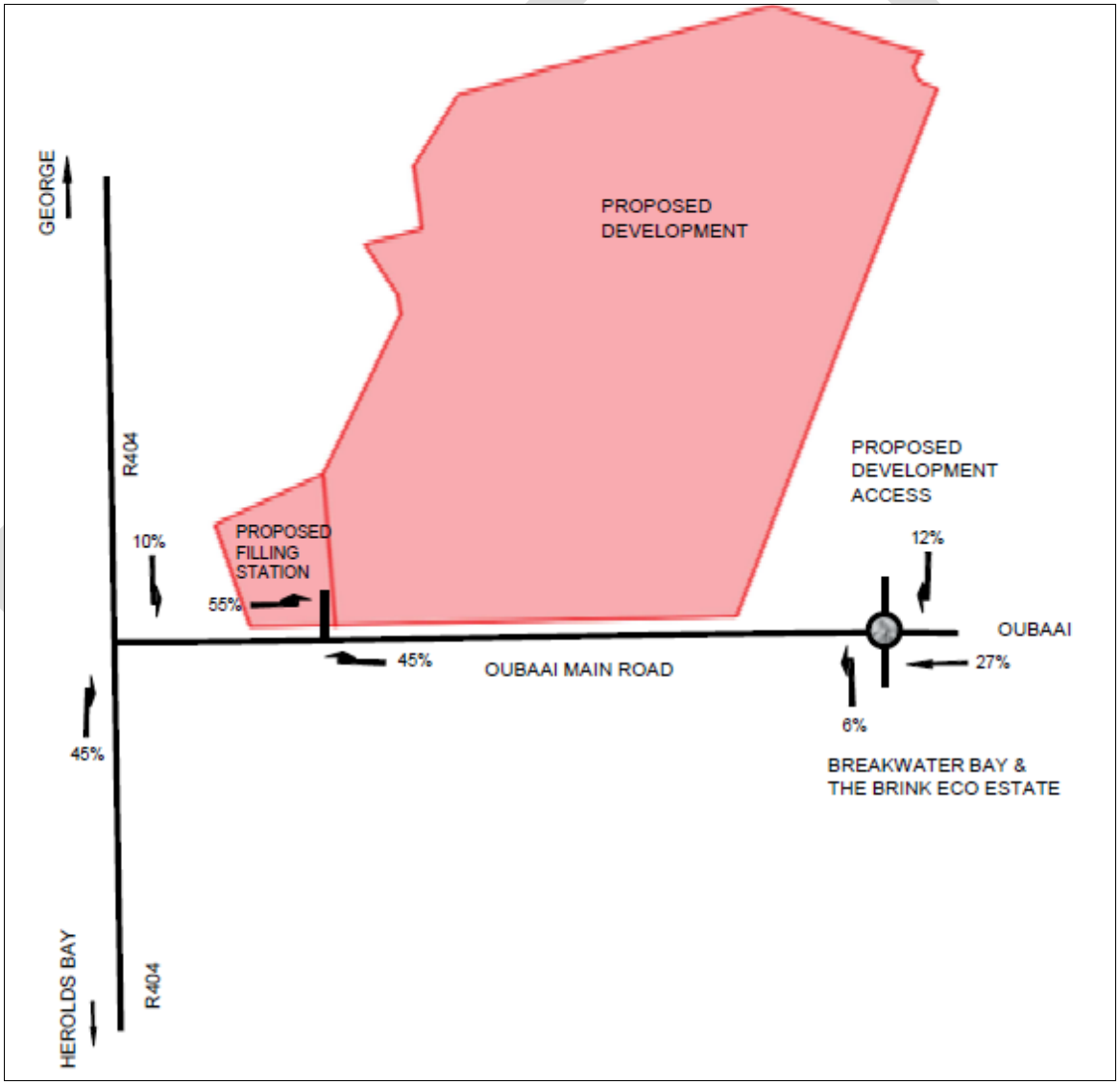


Figure 5: Trip distribution & assignment: Residential Estate

3 TRAFFIC DEMAND

3.1 Background traffic

Based on the defined study area, traffic counts were conducted from 06:00 to 18:000 on Wednesday 8 November 2018 at the intersection of the R404 and Oubaai Main Road as well as at the Oubaai Traffic Circle, to obtain true traffic volumes currently experienced in the area. The day on the traffic counts were conducted was a normal work and school day. No rain was present. Volumes for the 2020 base year for this study were inflated by 7% to account for the lapsed 15 months.

The volumes of the 2020 base year are indicated diagrammatically in the figures below for the weekday morning and weekday afternoon peak hour periods respectively:

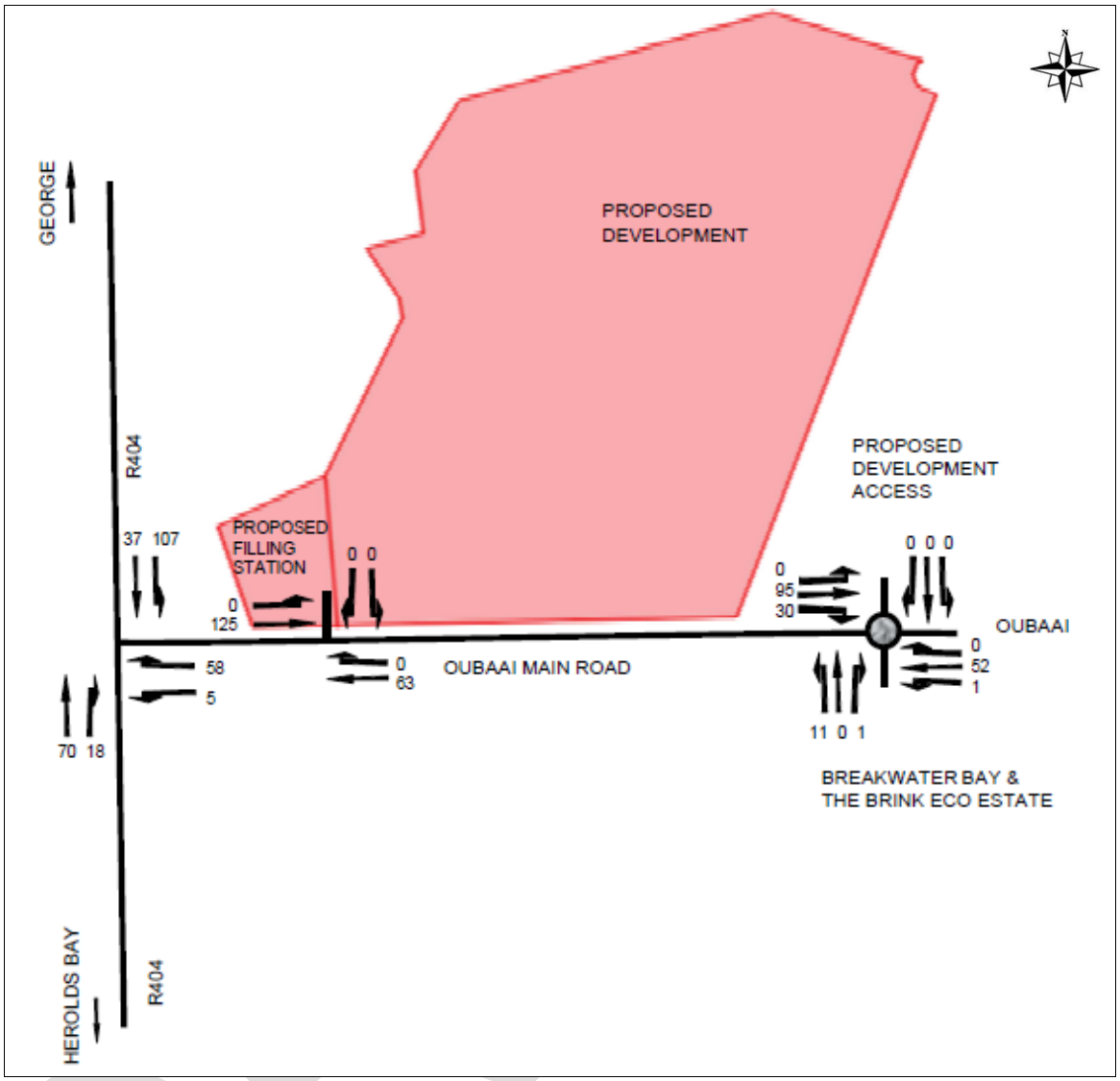


Figure 6: Background traffic: 2020 Base year: AM Peak Hour

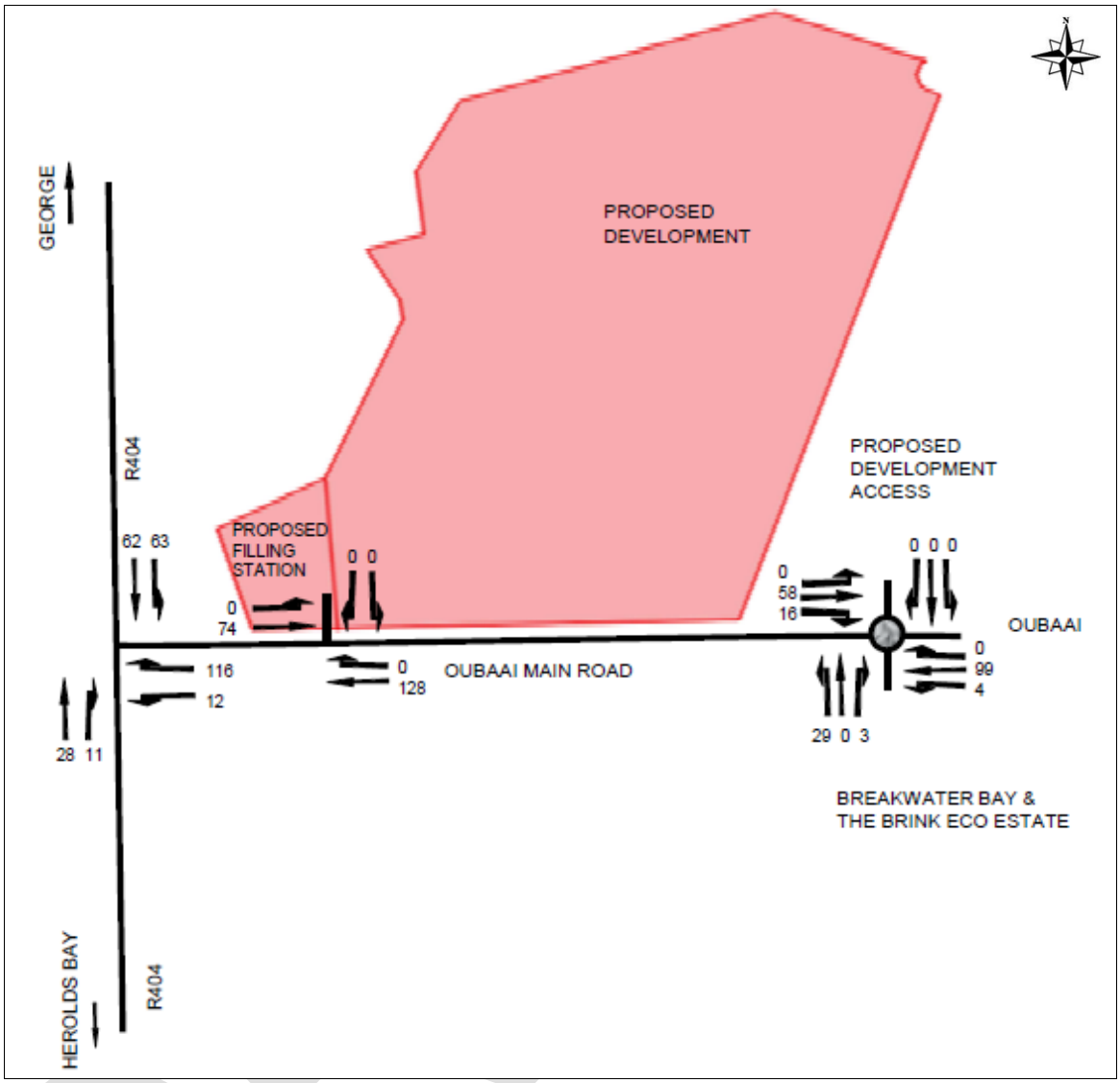


Figure 7: Background traffic: 2020 Base year: PM Peak Hour

3.2 Traffic growth rates

The TMH17: South African Trip Data Manual, recommends the following growth rate factors for different development areas:

Development Area	Growth rate
Low growth areas	0 - 3%
Average growth areas	3 - 4%
Above average growth areas	4 - 6%
Fast growing areas	6 - 8%
Exceptionally high growth areas	> 8%
Source: City Council of Pretoria (1998)	

Table 4: TMH17 Growth Rate Factors

The proposed development forms part of an area experiencing average growth, although limited geographically, whilst approved developments are not fully built-up yet. It is hence expected that the area will develop at an average growth rate, in line with the table above, of approximately 3.5%. A growth rate of 3.5% per annum will be thus be applied.

A standard horizon period of 5 years will be used to determine the impact of the proposed development on the surrounding road network.

The background volumes of the 2025 horizon year are indicated diagrammatically in the figures below for the weekday morning and weekday afternoon peak hour periods respectively:

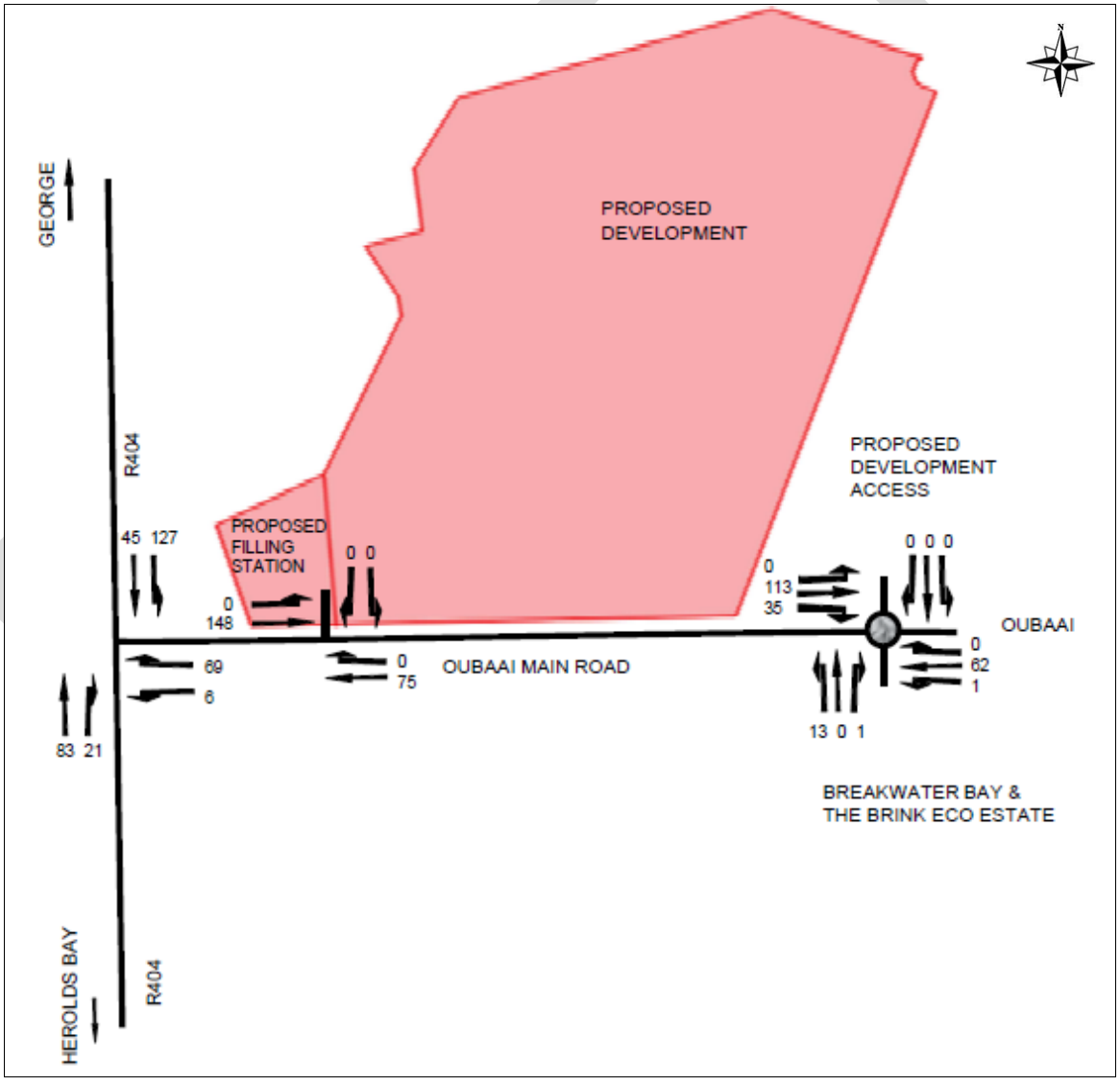


Figure 8: Background traffic: 2025 Horizon year: AM Peak Hour

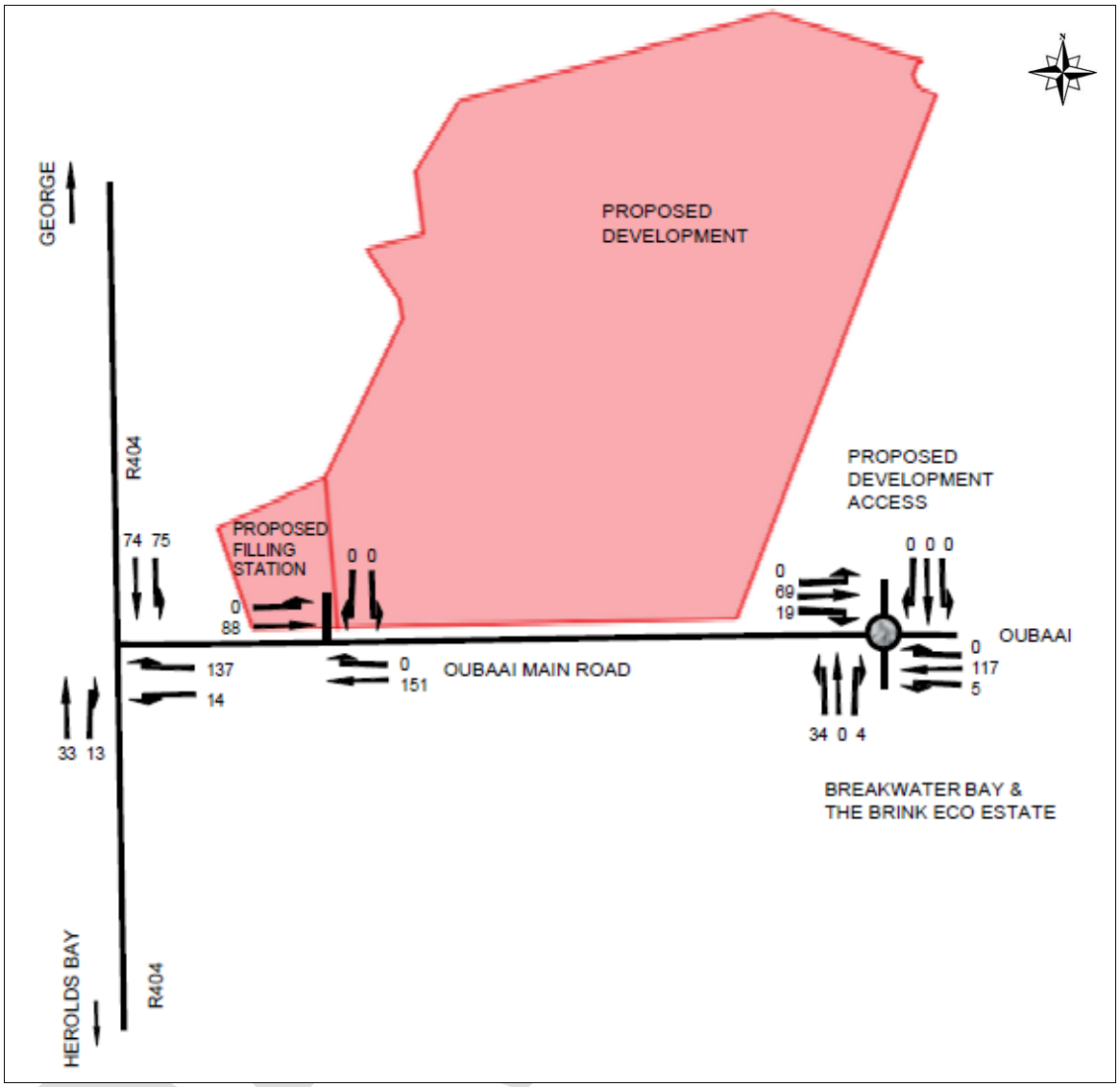


Figure 9: Background traffic: 2025 Horizon year: PM Peak Hour

3.3 Development traffic

The traffic generated by the proposed development, assigned to the road network, is indicated on the figures below for the weekday morning and weekday afternoon peak hour periods respectively (negative deflected and passer-by trip movements were ignored in the analysis due to the negligibly small traffic volumes involved in these movements):

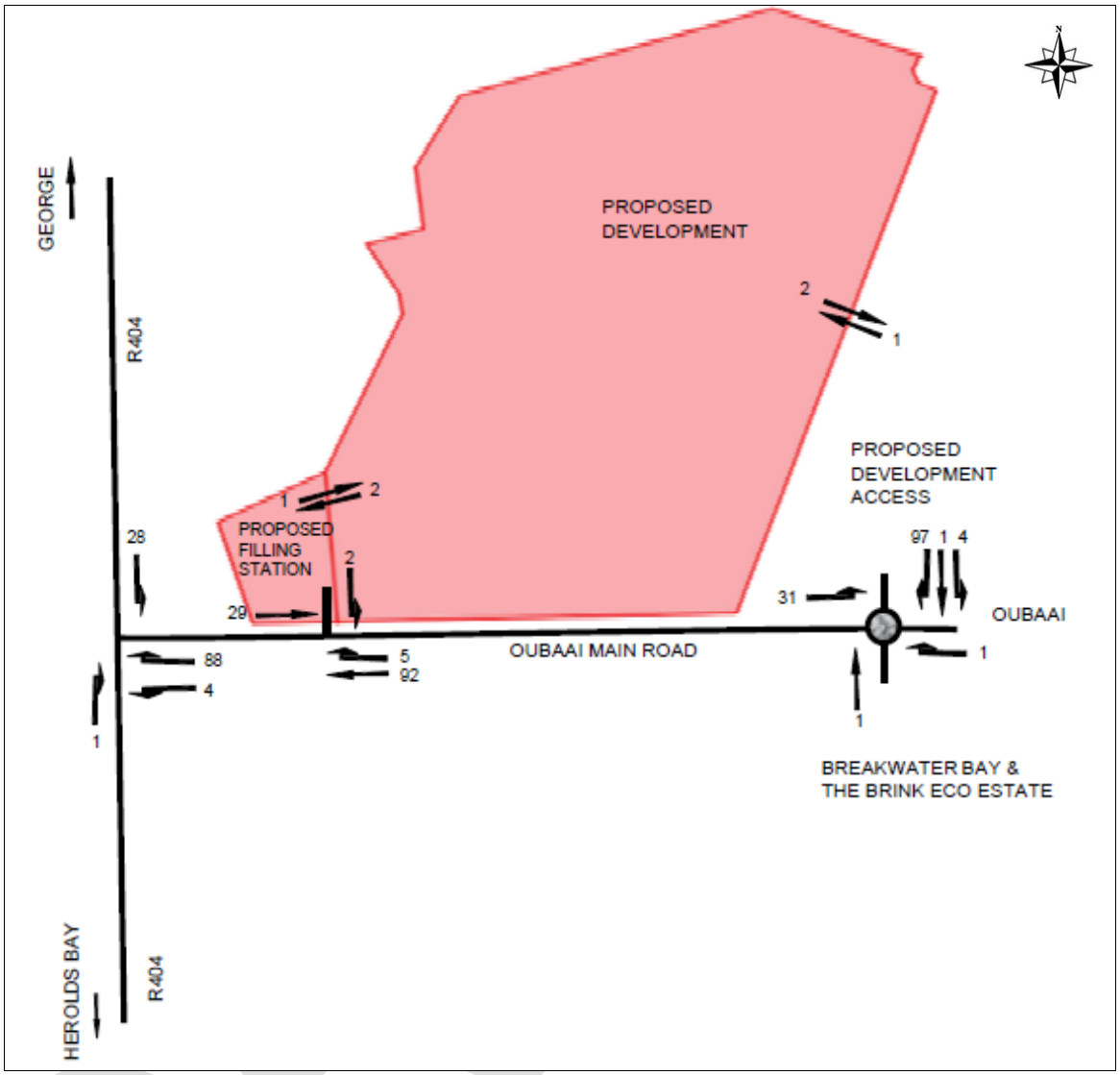


Figure 10: Development Traffic: Residential Estate: AM Peak Hour

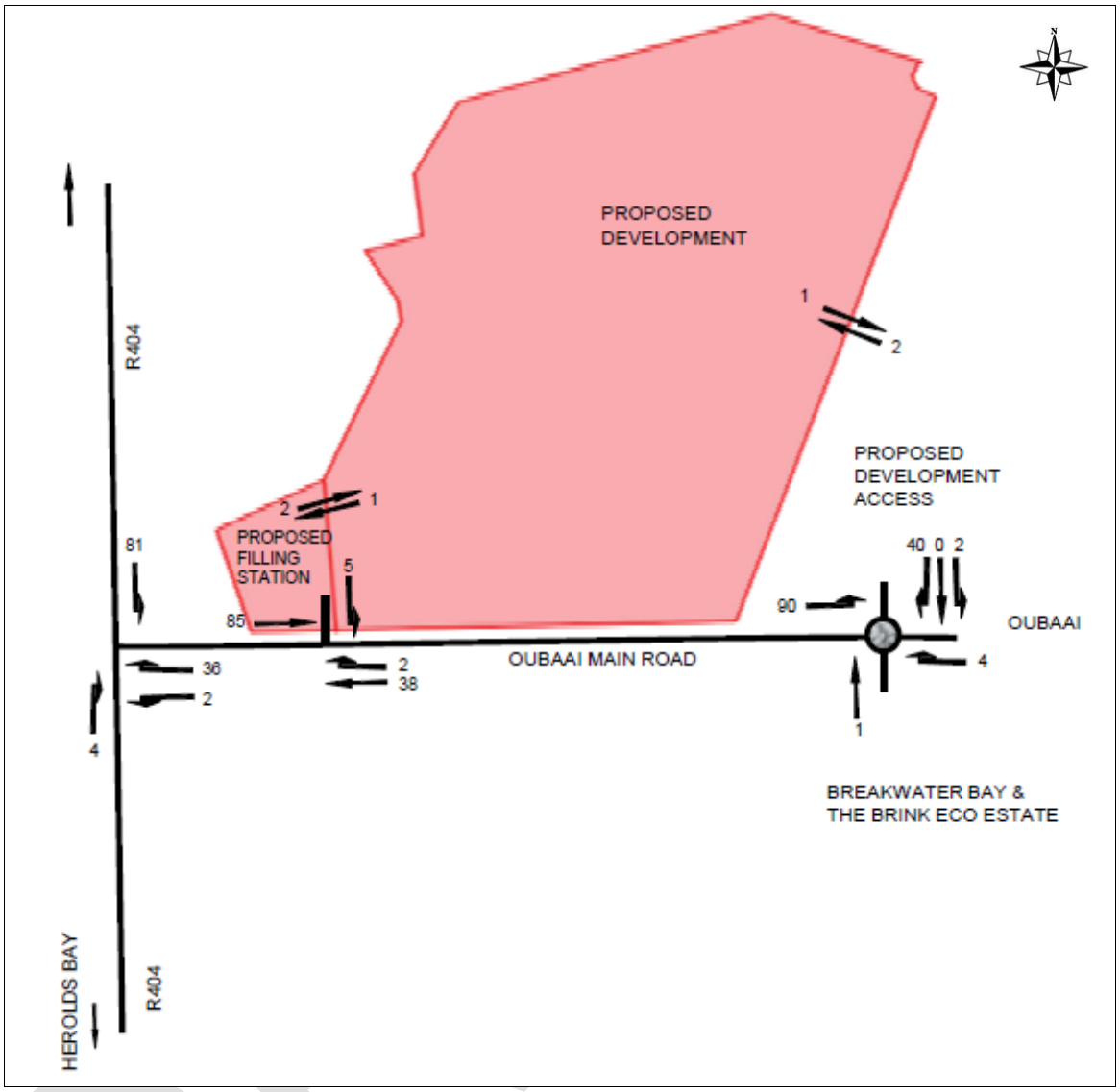


Figure 11: Development Traffic: Residential Estate: PM Peak Hour

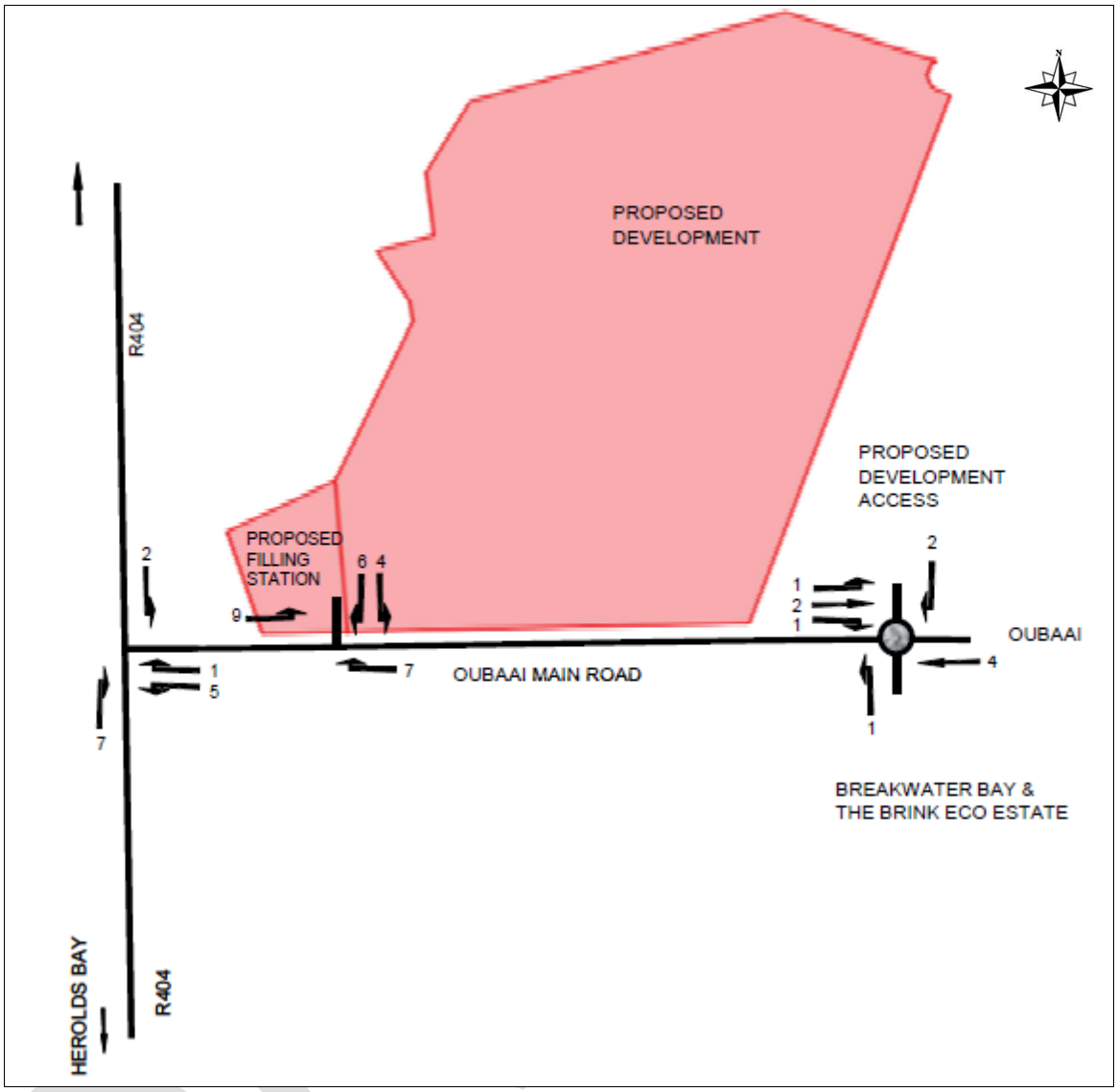


Figure 12: Development Traffic: Commercial Development: AM Peak Hour

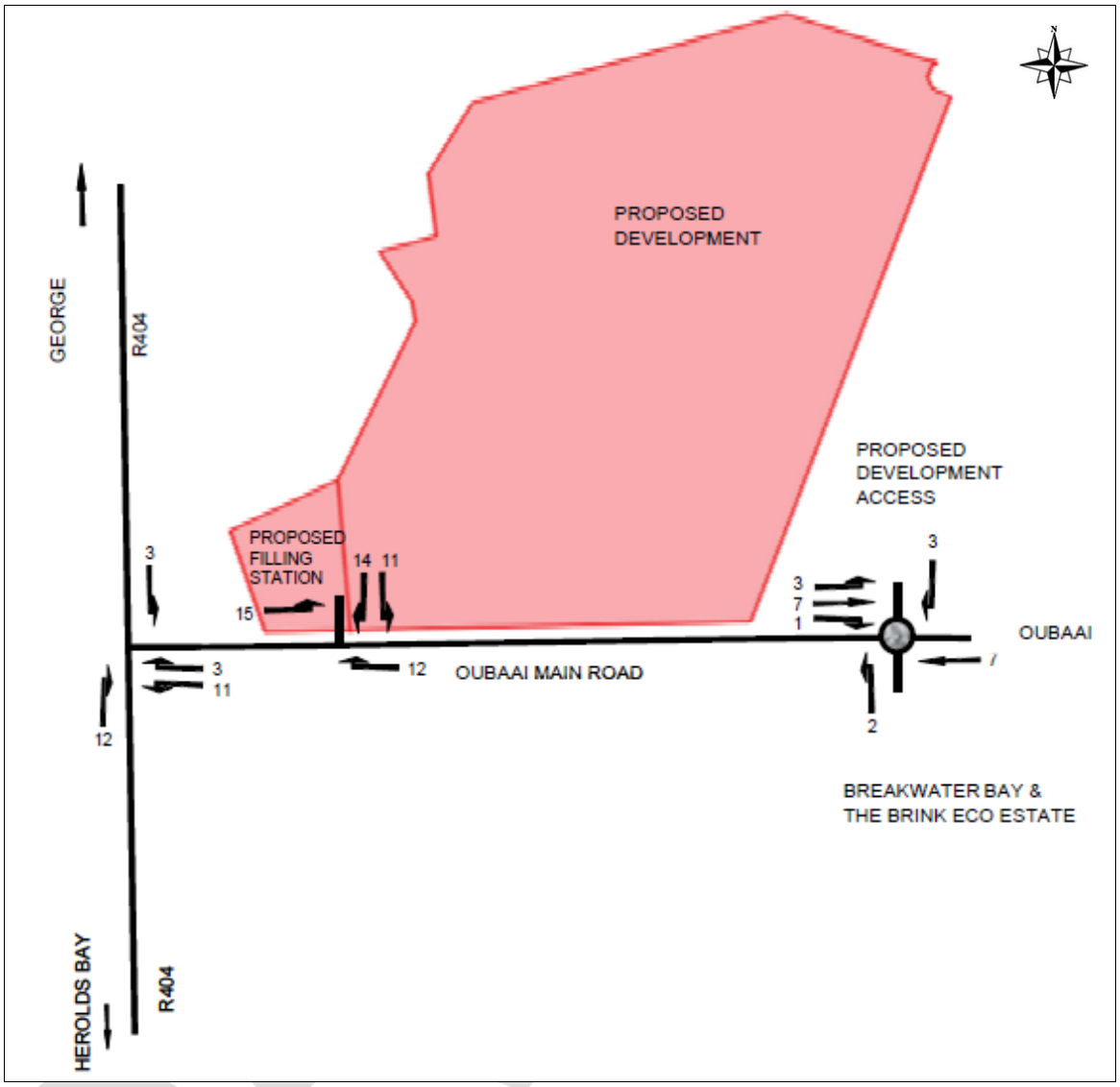


Figure 13: Development Traffic: Commercial Development: PM Peak Hour

3.4 Other developments

A number of developments are located adjacent and in close proximity to the study area. The extent of these developments and approved rights were studied as input into this report. Residential construction is ongoing at most of these estates and is expected to continue in the foreseeable future. The following developments were considered as background to the report:

- Oubaai Golf Estate – east of the traffic circle, shared circle
- Breakwater Bay Eco Estate – south of the traffic circle, shared circle
- The Brink Eco Estate – south of the traffic circle, shared circle
- Denneseerus – south of the commercial development, shared intersection

It is anticipated that the 3.5% annual traffic growth allowed for in this study, will be sufficient to allow for the medium term (5-year horizon period) expansion of these developments. For the long term however, limited further development will be possible in the area due to geographical constraints.

Notwithstanding the above, it is noted that a significant percentage of the background traffic counted comprises of construction traffic, a non-permanent traffic volume generator, which will remain for the medium term, but will subside to insignificance once all the estates are fully developed.

3.5 Total future traffic demand

The total future traffic demand, consisting of the future background traffic demand plus development traffic, is indicated on the figures below for the weekday morning and weekday afternoon peak hour periods respectively.

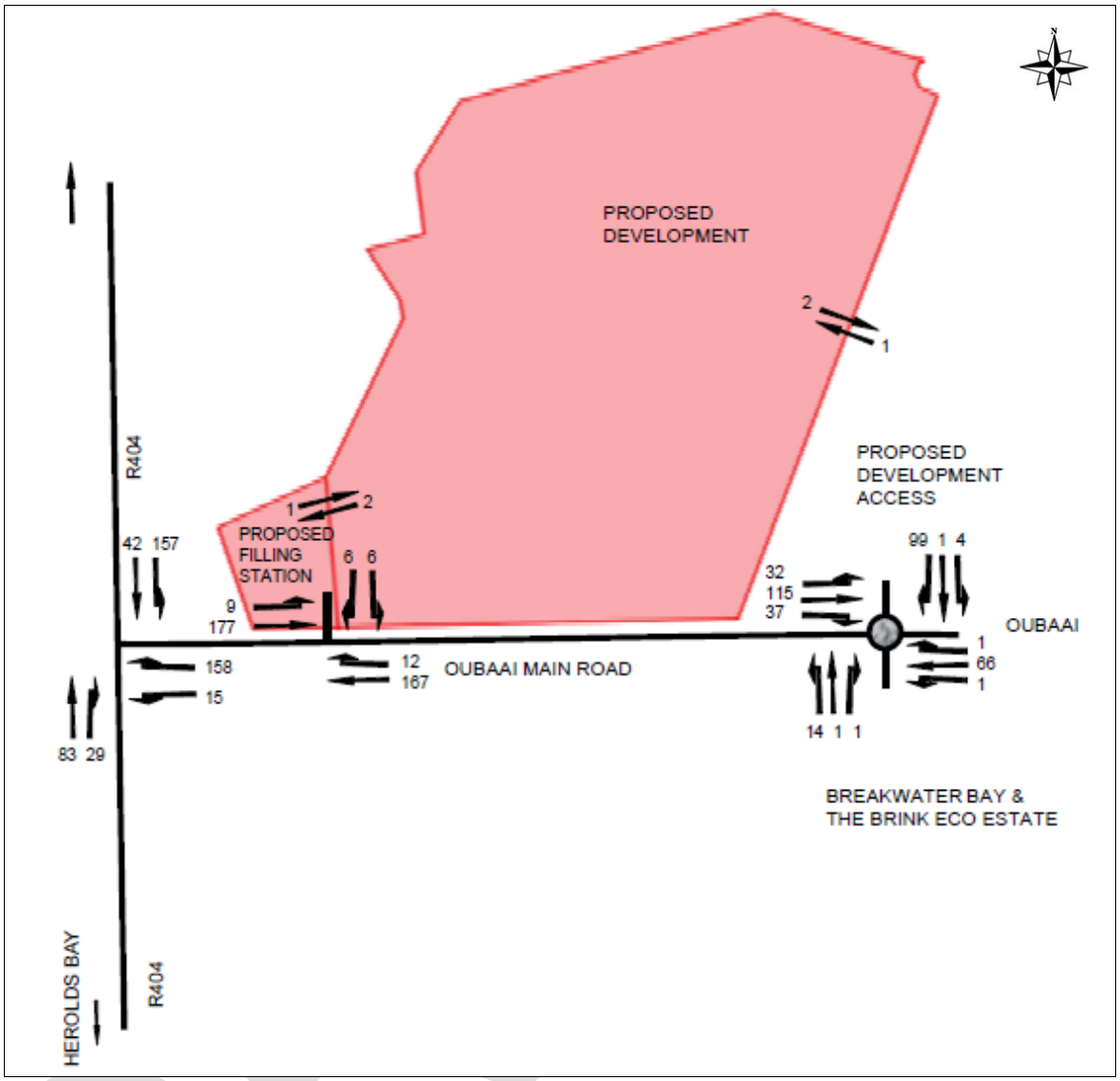


Figure 14: Total Traffic Demand: Horizon Year 2025: AM Peak Hour

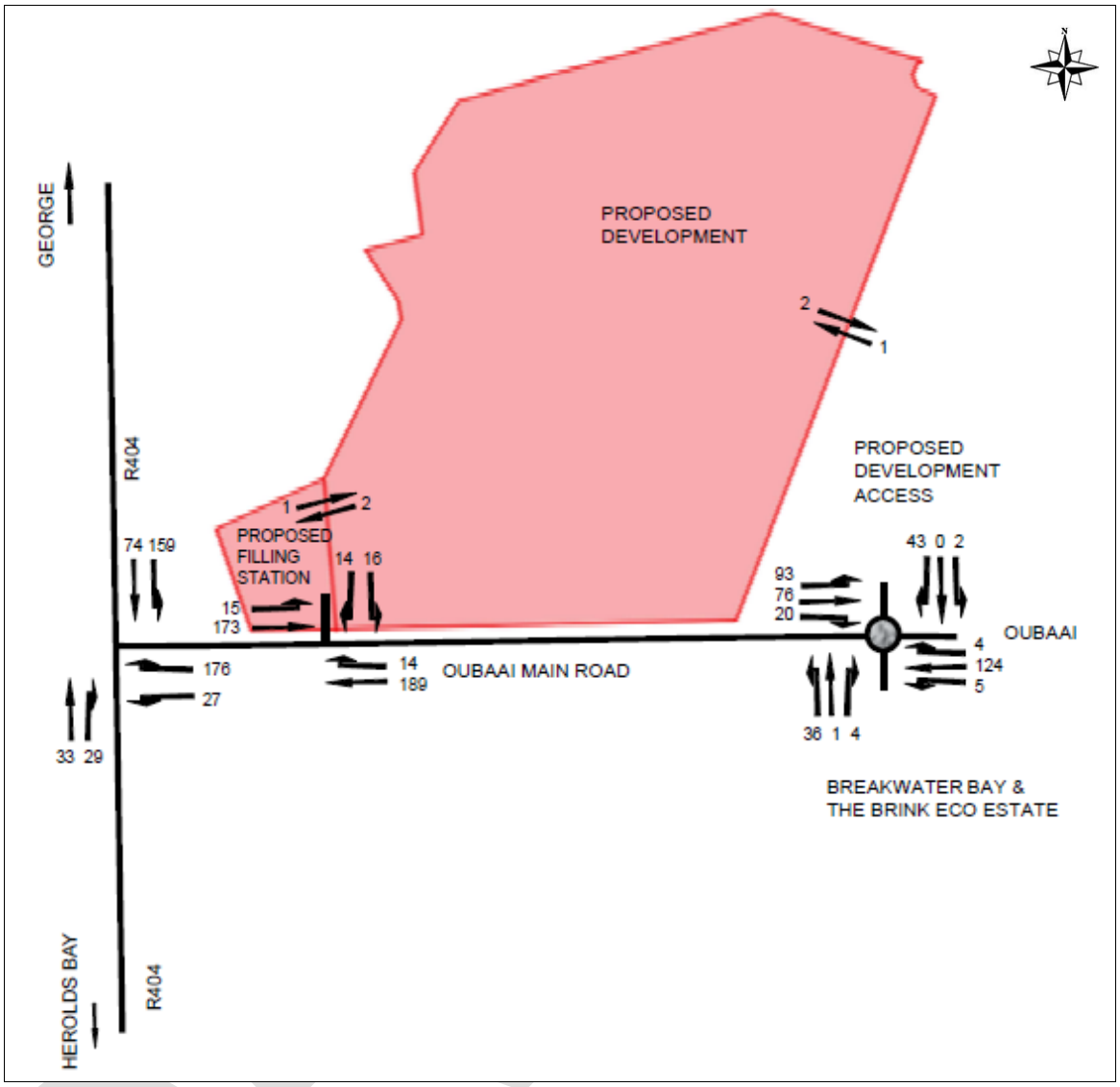


Figure 15: Total Traffic Demand: Horizon Year 2025: PM Peak Hour

4 CAPACITY ANALYSIS

A capacity analysis was performed for the weekday AM and PM peak hours for the existing background (2020), future background (2025) and total future traffic (2025) conditions. The capacity analysis was performed by means of the Sidra Intersection 8.0 software to compare the impact of the development against the background traffic.

A discussion of the analysis of the various intersections and scenarios is presented below, whilst the detailed Sidra results are included as addenda.

4.1 Intersection 1: Oubaai Main Road and Development Access

4.1.1 Existing Geometry

The existing intersection geometry consists of a traffic circle with a 12m internal diameter and 30m outer diameter. The traffic circle has single lanes in all approaches and provides access to all the developments in this node via Oubaai Main Road approaching from the west. The traffic circle provides access to the proposed development (north), to Oubaai Golf Estate (east) and to Breakwater Bay Eco Estate & The Brink Eco Estate (south). This geometry is shown in the figure below and was used to analyse the existing 2020, background 2025 and total traffic 2025 scenarios for the intersection.

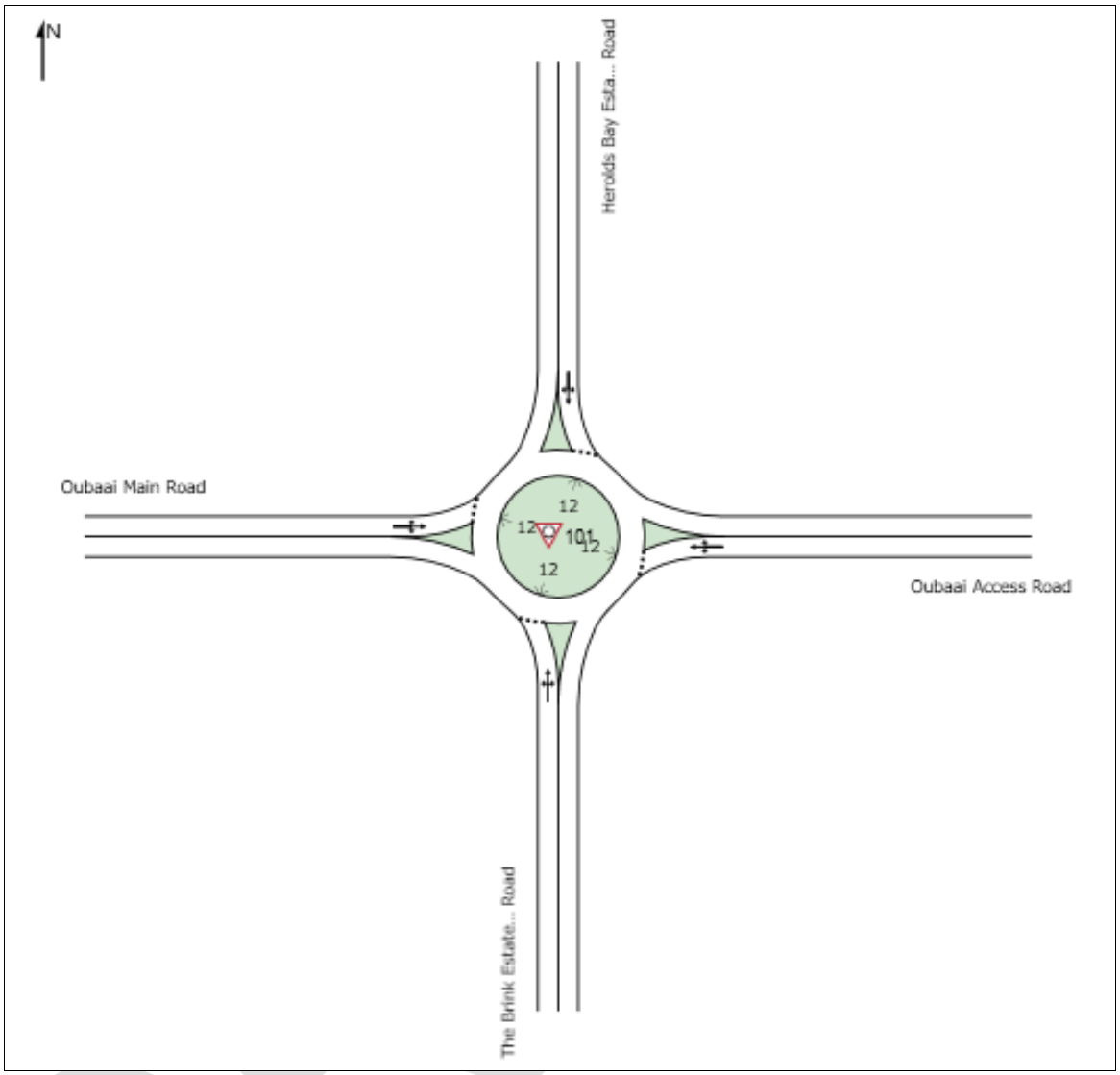


Figure 16: Intersection 1: Geometry: Oubaai Main Road and Development Access (Traffic circle)

4.1.2 Analysis

The results of the analysis are shown in tabular form below:

Scenario	Peak Hour	Intersection Control	Intersection Avg Delay (s)	Intersection LOS	Intersection v/c	Critical Approach				
						Approach	Movement	Delay	LOS	v/c
Existing (2020)	AM	Traffic Circle	5.0	A	0.081	S	L	3.8	A	0.011
							T	4.2	A	0.011
							R	7.7	A	0.011
						E	L	3.7	A	0.043
							T	4.0	A	0.043
							R	7.6	A	0.043
						N	L	3.1	A	0.003
							T	3.6	A	0.003
							R	6.9	A	0.003
						W	L	4.3	A	0.081
							T	4.6	A	0.081
							R	8.2	A	0.081
Background (2025)			5.0	A	0.096	S	L	3.9	A	0.013
							T	4.2	A	0.013
							R	7.8	A	0.013
						E	L	3.7	A	0.051
							T	4.1	A	0.051
							R	7.6	A	0.051
						N	L	3.2	A	0.003
							T	3.8	A	0.003
							R	7.0	A	0.003
						W	L	4.3	A	0.096
							T	4.6	A	0.096
							R	8.2	A	0.096
Total (2025)			5.7	A	0.117	S	L	4.5	A	0.015
							T	4.8	A	0.015
							R	8.4	A	0.015
						E	L	4.4	A	0.062
							T	4.7	A	0.062
							R	8.3	A	0.062
						N	L	3.4	A	0.096
							T	3.9	A	0.096
							R	7.2	A	0.096
						W	L	4.3	A	0.117
							T	4.6	A	0.117
							R	8.2	A	0.117

Scenario	Peak Hour	Intersection Control	Intersection Avg Delay (s)	Intersection LOS	Intersection v/c	Critical Approach				
						Approach	Movement	Delay	LOS	v/c
Existing (2020)	PM	Traffic Circle	4.5	A	0.076	S	L	4.1	A	0.029
							T	4.5	A	0.029
							R	8.0	A	0.029
						E	L	3.6	A	0.076
							T	3.9	A	0.076
							R	7.5	A	0.076
						N	L	2.8	A	0.003
							T	3.3	A	0.003
							R	6.6	A	0.003
						W	L	4.3	A	0.051
							T	4.6	A	0.051
							R	8.2	A	0.051
Background (2025)			4.6	A	0.090	S	L	4.2	A	0.035
							T	4.6	A	0.035
							R	8.1	A	0.035
						E	L	3.6	A	0.090
							T	4.0	A	0.090
							R	7.5	A	0.090
						N	L	2.9	A	0.003
							T	3.4	A	0.003
							R	6.7	A	0.003
						W	L	4.3	A	0.061
							T	4.6	A	0.061
							R	8.2	A	0.061
Total (2025)			4.9	A	0.127	S	L	4.5	A	0.039
							T	4.9	A	0.039
							R	8.5	A	0.039
						E	L	3.9	A	0.109
							T	4.3	A	0.109
							R	7.8	A	0.109
						N	L	3.0	A	0.040
							T	3.5	A	0.040
							R	6.8	A	0.040
						W	L	4.3	A	0.127
							T	4.7	A	0.127
							R	8.3	A	0.127

Table 5: Results of analysis: Oubaai Main Road and Development Access (Traffic Circle)

The results of the analysis indicate that the development has a negligible impact on the Level of Service during both the morning and afternoon horizon year peak hours and the intersection will continue to operate at a Level of Service A for both the morning and afternoon peak hours.

4.1.3 Mitigation measures

No upgrades or other mitigation measures are required or proposed for the intersection.

4.2 Intersection 2: Oubaai Main Road and Commercial Access

4.2.1 Existing Geometry

The existing intersection geometry has a shared through and right lane in the western approach, a shared through and left lane in the eastern approach, and a shared right and left lane in the southern approach (private development). The intersection is stop controlled from the south (private development). This geometry is shown in the figure below and was used to analyse the existing 2020 and background 2025 scenarios for the intersection.

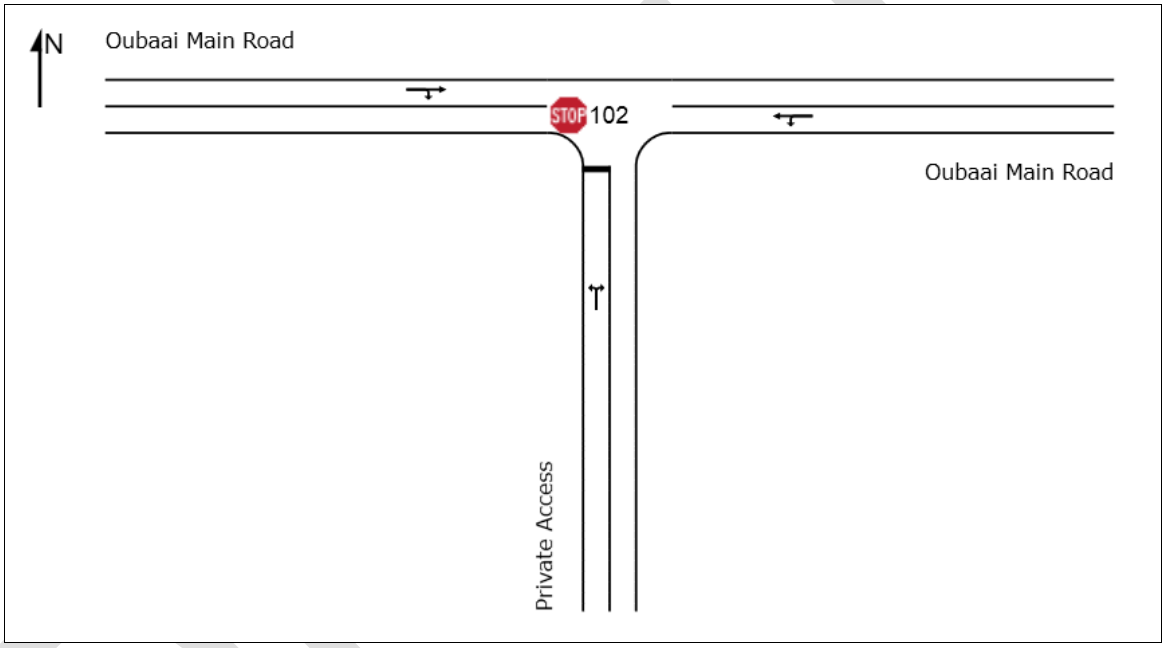


Figure 17: Intersection 2: Existing geometry

4.2.2 Proposed Geometry

The proposed intersection geometry to service the development has a shared left, through and right lane in the western approach, a shared left and right lane in the northern approach (this development), a shared left, through and right lane in the eastern approach, and a shared left and right lane in the southern approach (private development). The intersection is stop controlled from the north (this development) and south (private development). This geometry is shown in the figure below and was used to analyse the total traffic 2025 scenario for the intersection.

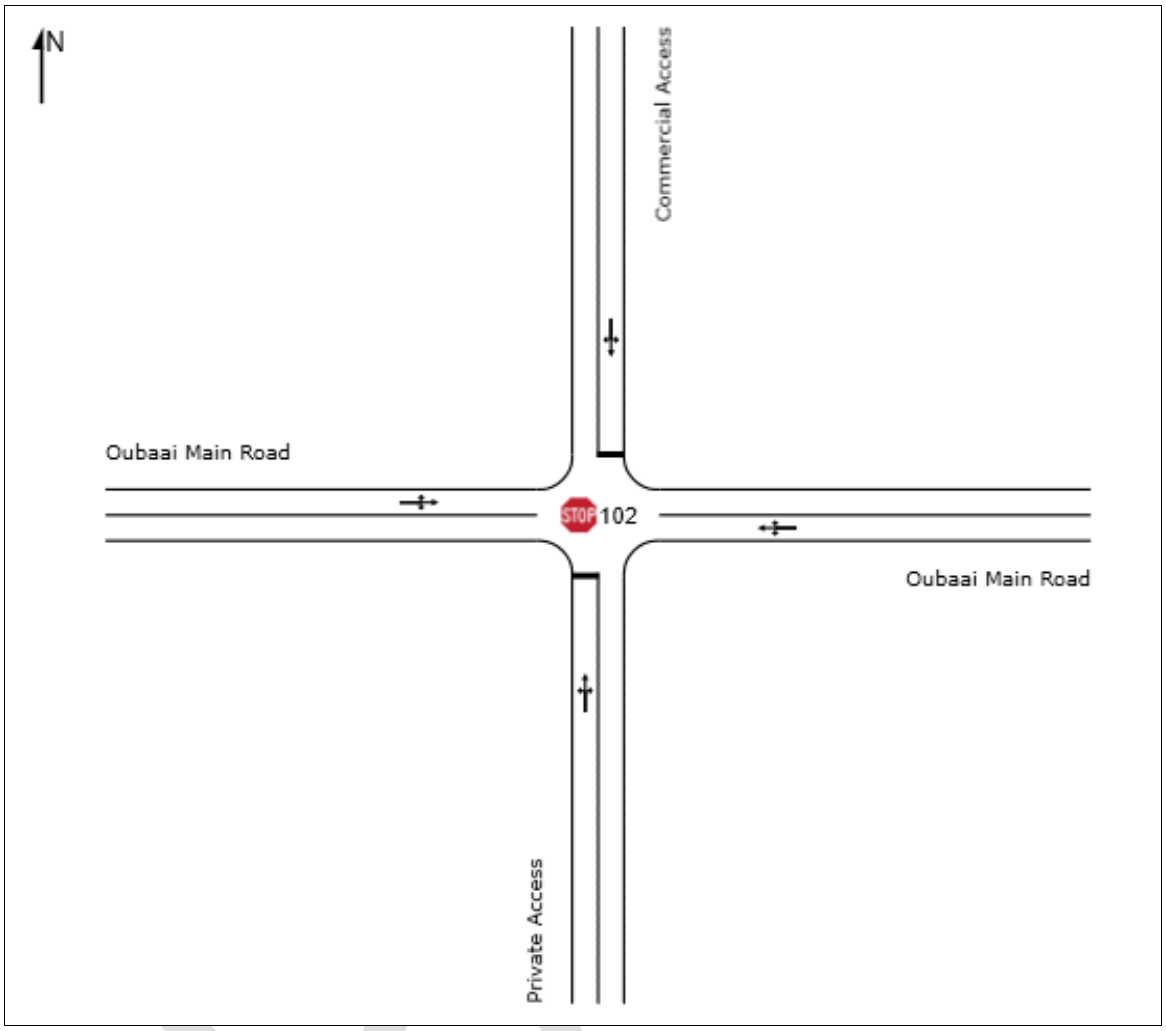


Figure 18: Intersection 2: Proposed geometry: Oubaai Main Road and Commercial Access

4.2.3 Analysis

The results of the analysis are shown in tabular form below:

Scenario	Peak Hour	Intersection Control	Intersection Avg Delay (s)	Intersection LOS	Intersection v/c	Critical Approach				
						Approach	Movement	Delay	LOS	v/c
Existing (2020)	AM	TWSC	0.1	NA	0.068	S	L	5.1	A	0.002
							R	5.1	A	0.002
						E	L	5.5	A	0.035
							T	0.0	A	0.035
						W	T	0.0	A	0.068
							R	5.3	A	0.068
Background (2025)			0.1	NA	0.081	S	L	5.1	A	0.002
							R	5.3	A	0.002
						E	L	5.5	A	0.041
							T	0.0	A	0.041
						W	T	0.0	A	0.081
							R	5.3	A	0.081
Total (2025)			0.6	NA	0.101	S	L	5.5	A	0.004
							T	6.4	A	0.004
							R	6.6	A	0.004
						E	L	6.2	A	0.099
							T	0.1	A	0.099
							R	6.1	A	0.099
						N	L	6.0	A	0.016
							T	6.9	A	0.016
							R	7.2	A	0.016
						W	L	5.2	A	0.101
							T	0.0	A	0.101
							R	5.7	A	0.101
Existing (2020)	PM	TWSC	0.1	NA	0.070	S	L	5.3	A	0.002
							R	5.2	A	0.002
						E	L	5.5	A	0.070
							T	0.0	A	0.070
						W	T	0.0	A	0.041
							R	5.5	A	0.041
Background (2025)			0.1	NA	0.083	S	L	5.4	A	0.002
							R	5.3	A	0.002
						E	L	5.5	A	0.083
							T	0.0	A	0.083
						W	T	0.0	A	0.048
							R	5.6	A	0.048
Total (2025)			1.0	NA	0.113	S	L	5.6	A	0.004
							T	6.6	A	0.004
							R	6.9	A	0.004
						E	L	6.2	A	0.113
							T	0.1	A	0.113
							R	6.1	A	0.113
						N	L	6.0	A	0.038
							T	7.2	A	0.038
							R	7.5	A	0.038
						W	L	5.2	A	0.103
							T	0.0	A	0.103
							R	5.8	A	0.103

Table 6: Results of analysis: Oubaai Main Road and Commercial Access

The results of the analysis indicate that the development has a negligible impact on the Level of Service during both the morning and afternoon horizon year peak hours and the intersection will continue to operate at a Level of Service A for both the morning and afternoon peak hours.

4.2.4 Mitigation measures

No other upgrades or mitigation measures, other than the new northern approach, are required or proposed for the intersection.

4.3 Intersection 3: Oubaai Main Road and Rooidraai Road/R404

4.3.1 Existing Geometry

The existing intersection geometry consists of a shared through and right lane from the south, a shared left and through lane from the north and a shared left and right lane from the east. This geometry is shown in the figure below and was used to analyse the existing 2020, background 2025 and total traffic 2025 scenarios for the intersection.

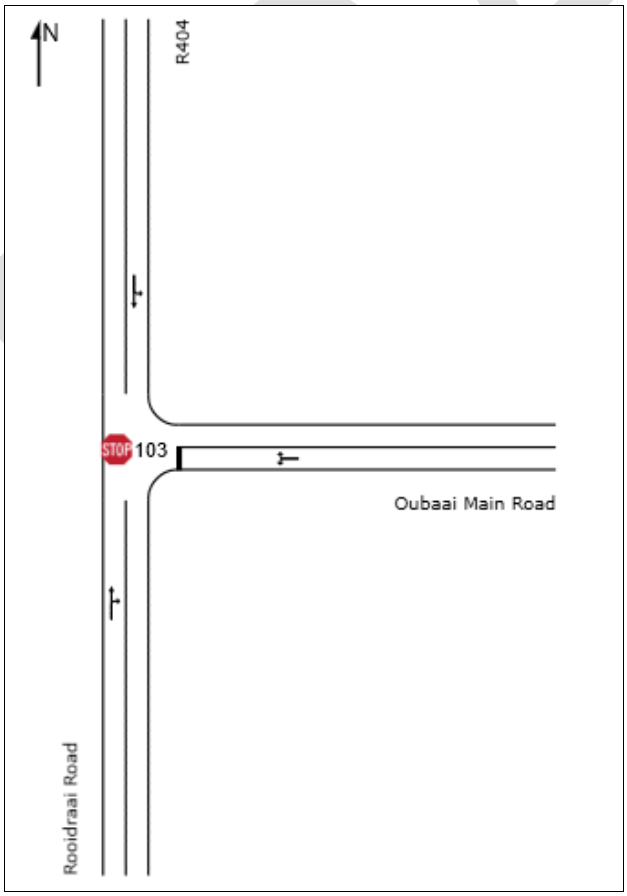


Figure 19: Intersection 3: Geometry: Oubaai Main Road and Rooidraai Road/R404

4.3.2 Analysis

The results of the analysis are shown in tabular form below:

Scenario	Peak Hour	Intersection Control	Intersection Avg Delay (s)	Intersection LOS	Intersection v/c	Critical Approach				
						Approach	Movement	Delay	LOS	v/c
Existing (2020)	AM	TWSC	4.2	NA	0.077	S	T	0.1	A	0.048
							R	5.9	A	0.048
						E	L	8.2	A	0.067
							R	8.3	A	0.067
						N	L	5.5	A	0.077
							T	0.0	A	0.077
Background (2025)			4.2	NA	0.092	S	T	0.2	A	0.057
							R	6.0	A	0.057
						E	L	8.2	A	0.082
							R	8.5	A	0.082
						N	L	5.5	A	0.092
							T	0.0	A	0.092
Total (2025)			5.3	NA	0193	S	T	0.3	A	0.064
							R	6.1	A	0.064
						E	L	8.2	A	0.193
							R	8.8	A	0.193
						N	L	5.6	A	0.106
							T	0.0	A	0.106
Existing (2020)	PM	TWSC	5.0	NA	0.129	S	T	0.2	A	0.022
							R	5.8	A	0.022
						E	L	8.3	A	0.129
							R	8.1	A	0.129
						N	L	5.5	A	0.066
							T	0.0	A	0.066
Background (2025)			5.1	NA	0.158	S	T	0.2	A	0.026
							R	5.9	A	0.026
						E	L	8.3	A	0.158
							R	8.3	A	0.158
						N	L	5.5	A	0.078
							T	0.0	A	0.078
Total (2025)			5.7	NA	0.220	S	T	0.6	A	0.039
							R	6.2	A	0.039
						E	L	8.4	A	0.220
							R	8.7	A	0.220
						N	L	5.6	A	0.124
							T	0.0	A	0.124

Table7: Results of analysis: Oubaai Main Road and Rooidraai Road/R404

The results of the analysis indicate that the development has a negligible impact on the Level of Service during both the morning and afternoon horizon year peak hours and the intersection will continue to operate at a Level of Service A for both the morning and afternoon peak hours.

4.3.3 Mitigation measures

No upgrades or other mitigation measures are required or proposed for the intersection.

5 SALIENT ISSUES

A number of salient issues are addressed below and shall also be considered in parallel to all relevant approved documentation and applicable legislation:

5.1 Access gate configuration & stacking distance

The design of the main access gate shall provide separate visitors and residents lanes in order to minimise congestion at the gate. A minimum stacking distance of 20m is required at the access gate. The design shall also provide for a u-turn facility.

5.2 Conceptual SDP of commercial erf and filling station layout

The conceptual Site Development Plan (SDP) of the commercial erf, as prepared by Brink Stokes Mkhize Architects, is presented in the diagram below:

Figure 20: Site Development Plan (SDP) of commercial centre

No vehicular thoroughfare may be obtained between the boundaries of the commercial site and the residential development. Pedestrian access may be provided at this point.

The conceptual layout of the filling station is provided below from a purely engineering perspective:

Figure 21: Conceptual layout of filling station with delivery truck movements indicated

Of note is the following conceptual design criteria:

- Fuel delivery truck manoeuvres accommodated on site and indicated on concept layout.
- Allowance in layout for fuel loading bay of 22m.
- Access width of 7.4m, with 1m additional surfaced shoulders on both sides, total surfaced access of 9.4m.
- Access bellmouth radius 15m.

The above conceptual design criteria shall be adhered to during the detail design and implementation of the filling station forecourt and access.

5.3 Sight Distances

Sight distances at both proposed access points are excellent in both the horizontal and vertical alignments and satisfactory for development purposes. An array of photographs below provides clarity on the sight distances at both access points.

Figure 22: North-western view along Oubaai Main Road at the existing traffic circle with the existing and proposed access (gravel road). Sight distance is excellent in both the horizontal and vertical alignments.

Figure 23: South-eastern view along Oubaai Main Road at the existing traffic circle with the existing and proposed access (gravel road) to the left and the existing accesses to Oubaai Golf Estate and Breakwater Bay Eco Estate in the centre and right respectively. Sight distance is excellent in both the horizontal and vertical alignments.

Figure 24: Western view along Oubaai Main Road at the proposed access to the filling station (on the right). Sight distance is excellent in both the horizontal and vertical alignments.

Figure 25: Eastern view along Oubaai Main Road at the proposed access to the filling station (on the left). Sight distance is excellent in both the horizontal and vertical alignments.

5.4 Warrants for right turn lanes

The total horizon year 2025 traffic at the commercial development access was weighed against the warrants for right turn lanes in order to consider the safety of right turn manoeuvres alongside and opposed to the main traffic stream in Oubaai Main Road. The warrants consider the total advancing volume, the total opposing volume, the percentage right turn movements as well as the vehicle speed on the through route.

The necessity of a right turn lane is not triggered in this analysis for this intersection. The analysis is presented on the graph in the following diagram.

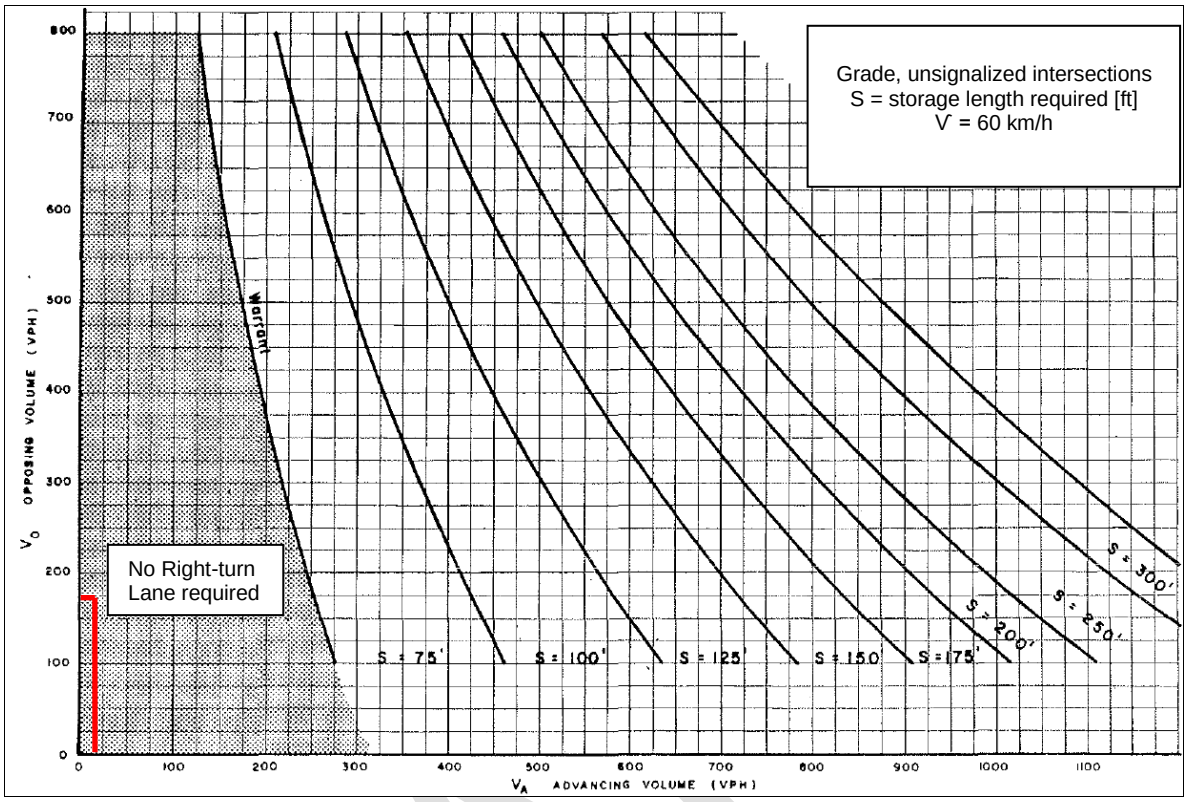


Figure 26: Warrant for right-turn storage lanes on two-lane highways for 60km/h road

5.5 Filling station feasibility

Extrapolation of the 12hour traffic counts of traffic passing the proposed filling station site, both on Rooidraai Road / R404 and Oubaai Main Road, indicates a 24-hour background traffic volume of 2,711 trips currently passing the filling station site. Anticipated development traffic may entail an approximate 24-hour traffic volume of 781 trips. A subsequent total 24-hour traffic volume of 3,492 trips will pass the filling station site.

An above-average draw off of 3% may be applied as no competing filling stations are located in close vicinity as well as taking into consideration the synergetic traffic pattern and draw-off for the convenience shop, restaurant and offices. An average purchase of 30l is assumed. A further assumption is that traffic will not subside significantly over weekends due to additional weekend-only trips to the beach, golf course and other attractions in the vicinity.

Based on these assumptions, a pumping volume of 73,000 litres per month is estimated with background traffic only. With development traffic added, this figure is estimated to rise to 94,000 litres per month.

5.6 Remote parking-, shuttle service & non-motorized transport facilities

The engineering report of the proposed development sets out details of the proposed remote parking, shuttle service and non-motorized transport facilities proposed to be provided. These proposals shall be adhered to during the detail design and implementation of the proposed development.

An extract of the engineering report is provided below:

It is recognized that a filling station and limited neighborhood centre with commercial and office space are much-needed in Herolds Bay. It is further recognized that remote parking is required to facilitate the provision of a shuttle service during peak seasons in order to alleviate seasonal traffic congestion into the Herolds Bay beach area.

It is proposed, as part of the development of the neighborhood centre, to provide limited safe and convenient seasonal dedicated remote parking to enable a shuttle service to operate to the Herolds Bay beach area. This will bring some relief to the traffic pressure and parking congestion experienced at the beach during peak season. The provision of this dedicated remote parking during peak season has been conceptually discussed with officials of the local municipality. The determination of the number of parking bays, the geometric design and implementation will be discussed with the local municipality.

In addition to the above, safe and dedicated non-motorized transport improvements will be designed and implemented surrounding the proposed development. These will include a.o. pedestrian and cycling facilities. These facilities will serve the larger Herolds Bay community and will link up with similar municipal non-motorized infrastructure into the Herolds Bay township.

Lastly, it is also proposed to engage with the local municipality to provide a future bus stop for the George Integrated Public Transport Network (GIPTN) bus service, at the proposed neighborhood centre. This proposal has also been conceptually discussed with officials of the local municipality and will be designed to the GIPTN engineering standards.

The diagram below indicates the schematic layout of proposed non-motorized transport facilities (pedestrian walkways) and GIPTN bus stops to be provided at the neighborhood centre.

Figure 27: Schematic layout of proposed non-motorized transport facilities (pedestrian walkways) and GIPTN bus stops to be provided at the neighbourhood centre.

5.7 Parking

Sufficient parking exists on the proposed SDP of the commercial development. Parking shall be provided for disabled persons at all public and commercial facilities.

5.8 Contractor's access

An investigation shall be performed into a contractor's access gate, separate from the main access gate, alternatively, kept to the side of the gate complex.

5.9 Refuse removal

Refuse removal shall be performed by the George Municipality in accordance with a signed services agreement. Access for municipal refuse removal vehicles shall be incorporated into the contractor's access arrangements. The provision of a solid waste collection area shall be incorporated into the access gate complex or in close vicinity to the access gate, in a manner so as not to hinder normal operations at the gate. The refuse removal facility could also be incorporated into the contractor's access.

6 CONCLUSSIONS

The following conclusions can be reached from the Traffic Impact Study for the proposed development of Herolds Bay Estate on Portion 7 of the Farm Buffelsfontein, Herolds Bay:

1. The purpose of the study is to assess the traffic impact of the proposed development on the adjacent road network.
2. The proposed development consists of 102 single residential erven, 68 group housing units, a filling station, 750m^2 convenience centre, 250m^2 restaurant and 300m^2 offices;
3. The proposed development is located directly north-east of Herolds Bay town and directly west of the existing Oubaai Golf Estate;
4. Access to the development is obtained via Oubaai Main Road from the existing traffic circle at the entrance to Oubaai Golf Estate and directly from Oubaai Main Road at a point approximately 78m east of the intersection with the R404;
5. A number of developments are located adjacent and/or in close proximity to the study area. The extent of these developments and approved rights were studied as input into this report;
6. Trip generation rates for the proposed development were determined in accordance with the TMH17 South African Trip Data Manual;
7. The peak hour trip generation of the residential development during the morning and afternoon peak hour of the adjacent road network is 141 vehicles. The peak hour trip generation of the commercial development for the afternoon peak hour is 33 vehicles. Total new trips for the development for the afternoon peak hour is 174. The peak hour deflected and passer-by trips of the commercial development for the afternoon peak hour is 19 trips;
8. Traffic counts were conducted from 06:00 to 18:000 on Wednesday 8 November 2018 in order to obtain existing background traffic volumes;
9. The study area is classified as an average growth area and a growth rate of 3.5% per annum was applied to obtain the horizon year traffic volumes;
10. A capacity analysis was performed for the weekday AM and PM peak hours for the existing background (2020), future background (2025) and total future traffic (2025) conditions. The capacity analysis was performed by means of the Sidra Intersection 8.0 software to compare the impact of the development against the background traffic. The analysis concluded the following:
    a. Intersection 1 (Oubaai Main Road and Development Access - Traffic circle): The development has a negligible impact on the Level of Service

during both the morning and afternoon horizon year peak hours and the intersection will continue to operate at a Level of Service A for both the morning and afternoon peak hours;

b. Intersection 2 (Oubaai Main Road and Commercial Access): The development has a negligible impact on the Level of Service during both the morning and afternoon horizon year peak hours and the intersection will continue to operate at a Level of Service A for both the morning and afternoon peak hours;

c. Intersection 3 (Oubaai Main Road and Rooidraai Road/R404): The development has a negligible impact on the Level of Service during both the morning and afternoon horizon year peak hours and the intersection will continue to operate at a Level of Service A for both the morning and afternoon peak hours;

11. The design of the main access gate shall provide separate visitors and residents lanes in order to minimise congestion at the gate. A minimum stacking distance of 20m is required at the access gate. The design shall also provide for a u-turn facility;
12. No vehicular thoroughfare may be obtained between the boundaries of the commercial site and the residential development. Pedestrian access may be provided at this point;
13. The conceptual design criteria provided in the engineering report for the filling station forecourt and access shall be adhered to during the detail design and implementation of the commercial development;
14. Sight distances at both proposed access points are excellent in both the horizontal and vertical alignments and satisfactory for development purposes;
15. Parking, remote parking-, shuttle service & non-motorized transport facilities shall be provided as per the engineering report;
16. An investigation shall be performed into a contractor's access gate, separate from the main access gate, alternatively, kept to the side of the gate complex.
17. Refuse removal shall be performed by the George Municipality in accordance with a signed services agreement. The provision of a solid waste collection area shall be incorporated into the access gate complex, in close vicinity to the access gate, or incorporated into the contractor's access.

7 RECOMMENDATIONS

In line with the conclusions above, the following is recommended:

1. It is recommended that the proposed development of Herolds Bay Estate on portion 7 of farm Buffelsfontein, Herolds Bay be approved from a Traffic Engineering perspective;
2. That all recommendations contained in this report be implemented in accordance with the relevant design standards and legislation;
3. That all recommendations contained in the report be implemented in accordance with a phased programme to be negotiated with the relevant authorities.

8 ADDENDA

8.1 Addendum A – Site development plan

8.2 Addendum B – Traffic volumes

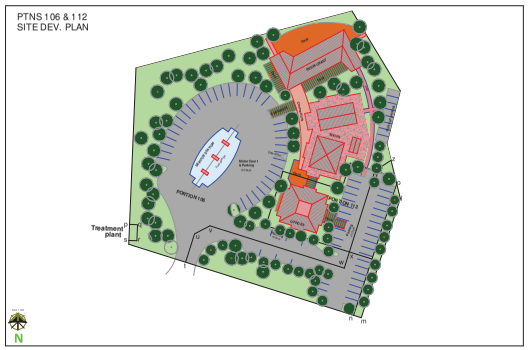
8.3 Addendum C – Sidra analysis, graphics and results

ADDENDUM A

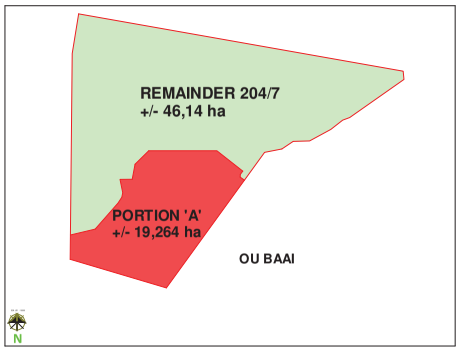
Site development plan

INSERT 1

PTNS 106 & 112
SITE DEV. PLAN

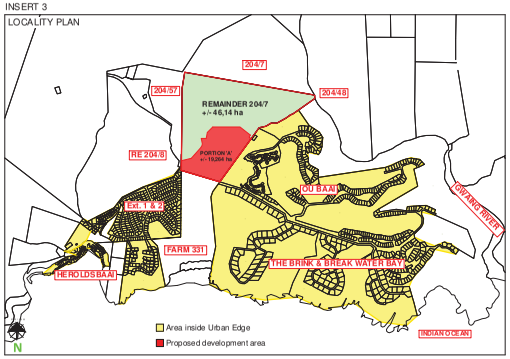


INSERT 2

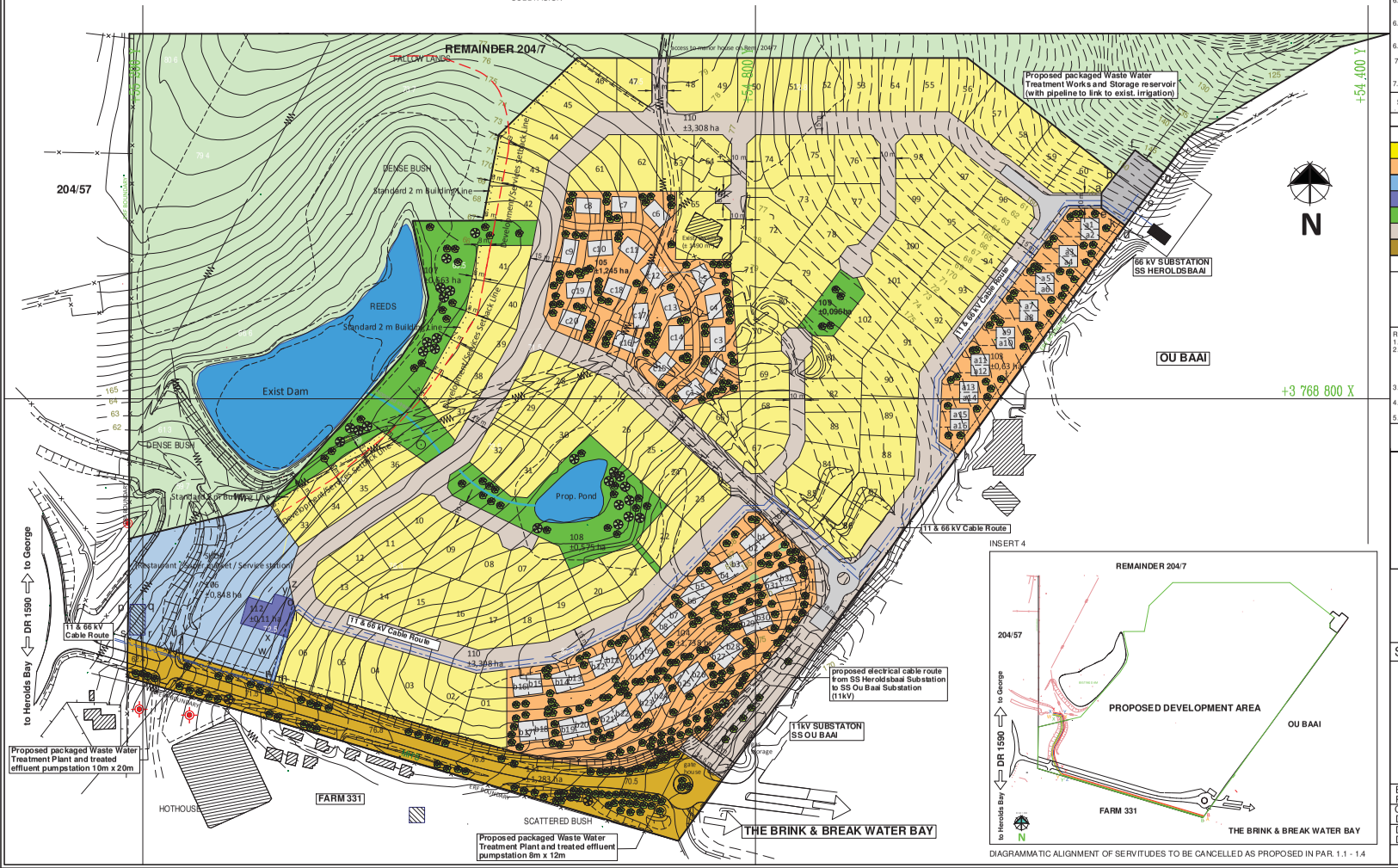


INSERT 3

LOCALITY PLAN



SUBDIVISION



INSERT 4

DIAGRAMMATIC ALIGNMENT OF SERVITUDES TO BE CANCELLED AS PROPOSED IN PAR. 1.1 - 1.4

APPLICATION FOR THE CANCELLATION AND REGISTRATION OF SERVITUDES, SUBDIVISIONS, REZONING, AND CONSENT USES IN TERMS OF THE RELEVANT SECTIONS OF THE BY-LAWS ON LAND USE PLANNING FOR THE MUNICIPALITY OF GEORGE, 2015.

APPLICATION IS BEING MADE FOR :

1. Cancellation in terms of Section 15.2 (f) of the following title conditions applicable to servitudes as per Deed of Transfer T038436/2017 (as shown on insert 4):

1.1 Par. B: A servitude right of way, 5.87 wide, marked XYZ, on SG Diagram 2223/45;

1.2 Par. C: Right-of-way, 5.67m wide, marked WXYA on SG Diagram 1827/52;

1.3 Par. D: Servitude, 9.45m wide, marked XY & YB on SG Diagram 916/65; and

1.4 Par. E: Right-of-way, 9.45m wide, marked XY and line YB on SG Diagram 5727/58.

2. Subdivision in terms of Section 15.2 (d) of Portion 7 of Farm Buffelsfontein No 204 as follows: (INSERT 2):

2.1 Portion A =±19.26 ha; and

2.2 Remainder Buffelsfontein 204/7 = ±46.14 ha.

3. Rezoning in terms of Section 15.2 (a) of the above mentioned PTN. A from Agriculture Zone 1 to Subdivisional Area;

4. Subdivision of the above mentioned Subdivisional Area in terms of Section 15.2 (d) as shown on plan and Table A.

5. Consent use in terms of Section 15.2 (o) for Restaurant/Supermarket/Service Station on Portion 106.

6. Registration of the following servitudes in terms of Section 15.2 (d)

6.1 Services servitude area, marked Figure a b c d e including servitude right-of-way for access to servitude area for packaged waste water treatment works and storage reservoir marked Figure f g c b on Remainder 204/7;

6.2 Services servitude area 3m wide marked Figure h j k d on proposed Portion 103;

6.3 Services servitude area 3m wide marked Figure l m n o on Ptns.112 and 106;

6.4 Servitude area marked Figure p q r s for packaged waste water treatment works and pump station on Ptn. 106;

6.5 Line t u v w x represents the centre line of a servitude r-o-w, 6m wide, on Ptn. 106 in favour of Ptn. 112, Ptn. 110 and Rem. Farm 204/7;

6.6 Line x y represents the centre line of a 6m services r-o-w on Ptn. 112 in favour of Ptn. 106, Ptn. 110 and Rem. Farm 204/7;

6.7 Line y z represents the centre line of a 6m wide services r-o-w on Ptn 106 in favour of Ptn. 110 and Rem Farm 204/7;

6.8 Access to the treatment plant on Figure p q r s will be registered in general terms on Ptn. 106 in favour of the H.O.A.

7.6 A servitude for pipeline from treatment works to retention pond on Ptn. 108 via private road and Pr. O.S. (Ptn 109) will be registered when route is finalised.

7.7 Notarial Deed to be registered on Ptn. 107 in favour of Rem. Farm Buffelsfontein 204/7

SITUATED AT HEROLDS BAY IN THE MUNICIPALITY AND ADMINISTRATIVE DISTRICT OF GEORGE.

Table A

Zoning	Ptn No's	Land Use	Number	Area (ha)	%
Residential Zone I	1 - 102	Single Dwelling *	102	± 9,019 *	47
General Residential Zone II	103, 104 & 105	Group Housing**	3	± 3,613	19
Business Zone II	106	Shop***	1	± 0,848	4,4
Business Zone IV****	112	Office (300 m² floor space)	1	± 0,11	0,6
Open Space II	107, 108 & 109	Private Open Space	3	± 1,334	7
Transport Zone III	110	Private Road	1	± 3,209	16
Transport Zone II	111	Public Street	1	± 1,283	6
Total			111	± 19,264	100

* Average erf size = 882 m² (min. +/- 733 m² and max. = 1020 m² - excl. Ptn. 65 with exist. dwelling)
** Average density :
Ptn 103 = 16 units @ 25,8 /ha. (a1 - a16)
Ptn 104 = 32 units @ 18,4 /ha. (b1 - b32)
Ptn 105 = 20 units @ 16,1 /ha. (c1 - c20)
*** SHOP (Restaurant / Super market / Service station - Consent Use)

REMARKS:
1. Land concerned situated outside 'Urban Edge' in terms of 2015 L.S.D.P.
2. The emergency 11kV powerline connecting the 66kV and 11kV Sub-station on the abutting Oubaai will be accommodated within a 3m wide servitude to be registered along the south-eastern boundary of Portion 103. The 66kV and 11kV Municipal connecting powerlines from the 66kV Sub-station to Herolds Bay and the rural area will be accommodated in the proposed 15m wide road reserves as well as a 3m wide service servitude along the western boundary of Ptn. 6.
3. The Oubaai/The Brink/Breakwater Bay access road was surveyed, but diagram was not registered and therefore still forms part of Rem. 204/7.
4. Dimensions of Development/Services Setback Line on Ptns 33 - 43 are shown on plan where more restrictive than Standard municipal 2,0 m building line.
5. Development will be implemented in phases.

NOTES:
1. Contour and Cadastral information by Azur Aerial Services.
2. Contour intervals: 1.0m

HEROLDS BAY
COUNTRY ESTATE

PTN. 7 (A PORTION OF PORTION 6) FARM BUFFELSFONTEIN No. 204 SITUATED IN MUNICIPALITY AND ADMIN. DIST. OF GEORGE

SKAAL 1 : 1500 (A1) 1 : 2000 (A2) 1 : 3000 (A3) SCALE

del & dek
Town and Regional Planners
Stads -en Streekbeplanners
Yorkstraat 56 York Street
Posbus 1186 / P.O. Box 1186
George 6530
Tel: (044) 874 5207
Fax: (044) 873 6354
E-pos / E-mail: neldek@mweb.co.za

Beplan Planned	D.N.	Plan No	HDB/C/204-2
Geteken Drawn	REL		
Datum Date	DESEMBER 2019		

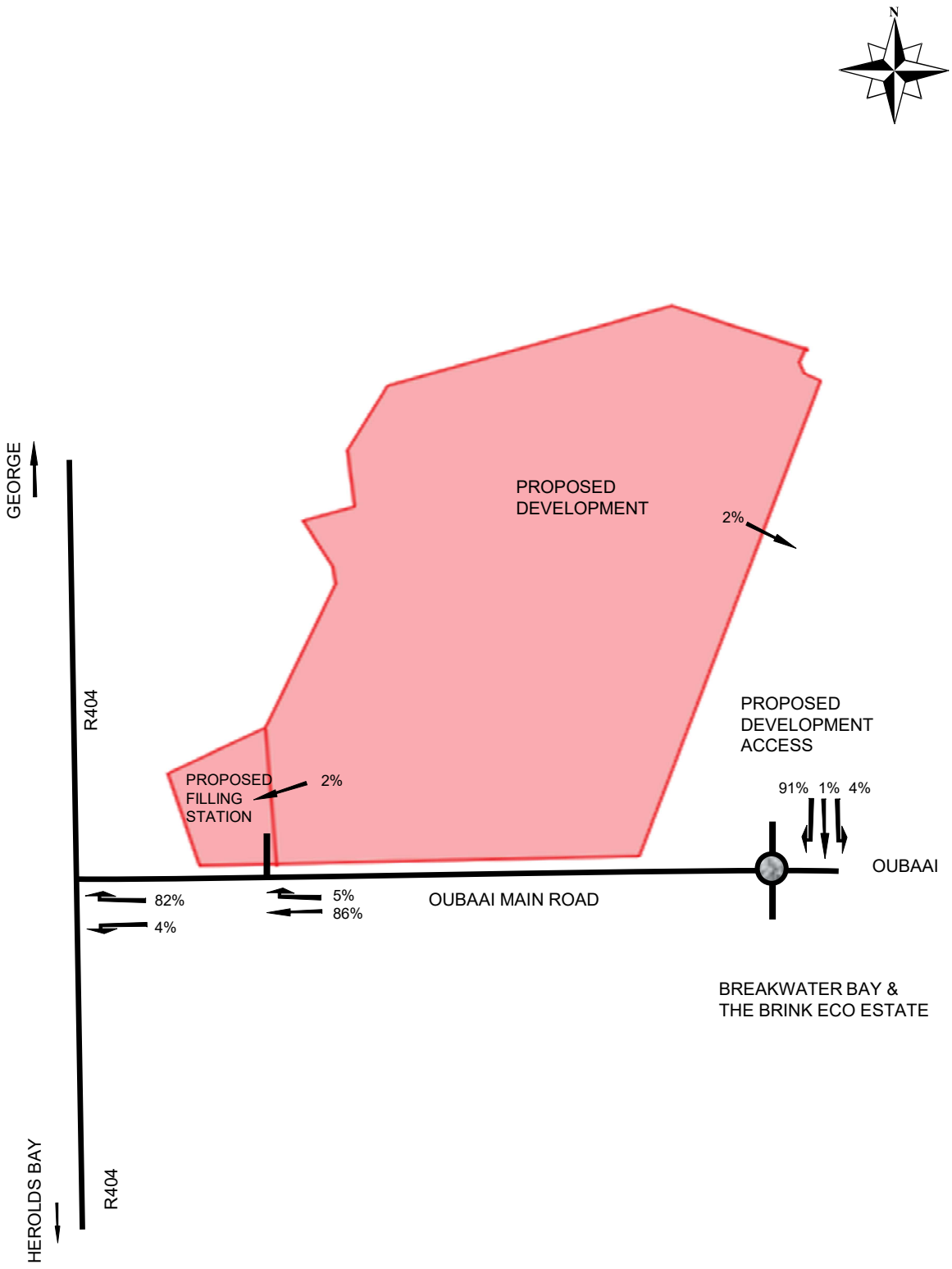
HEROLDS BAY COUNTRY ESTATE
COMMERCIAL CENTRE

SCALE 1:500

BRINK STOKES MKHIZE architects + landscape architects

ANNEXURE B

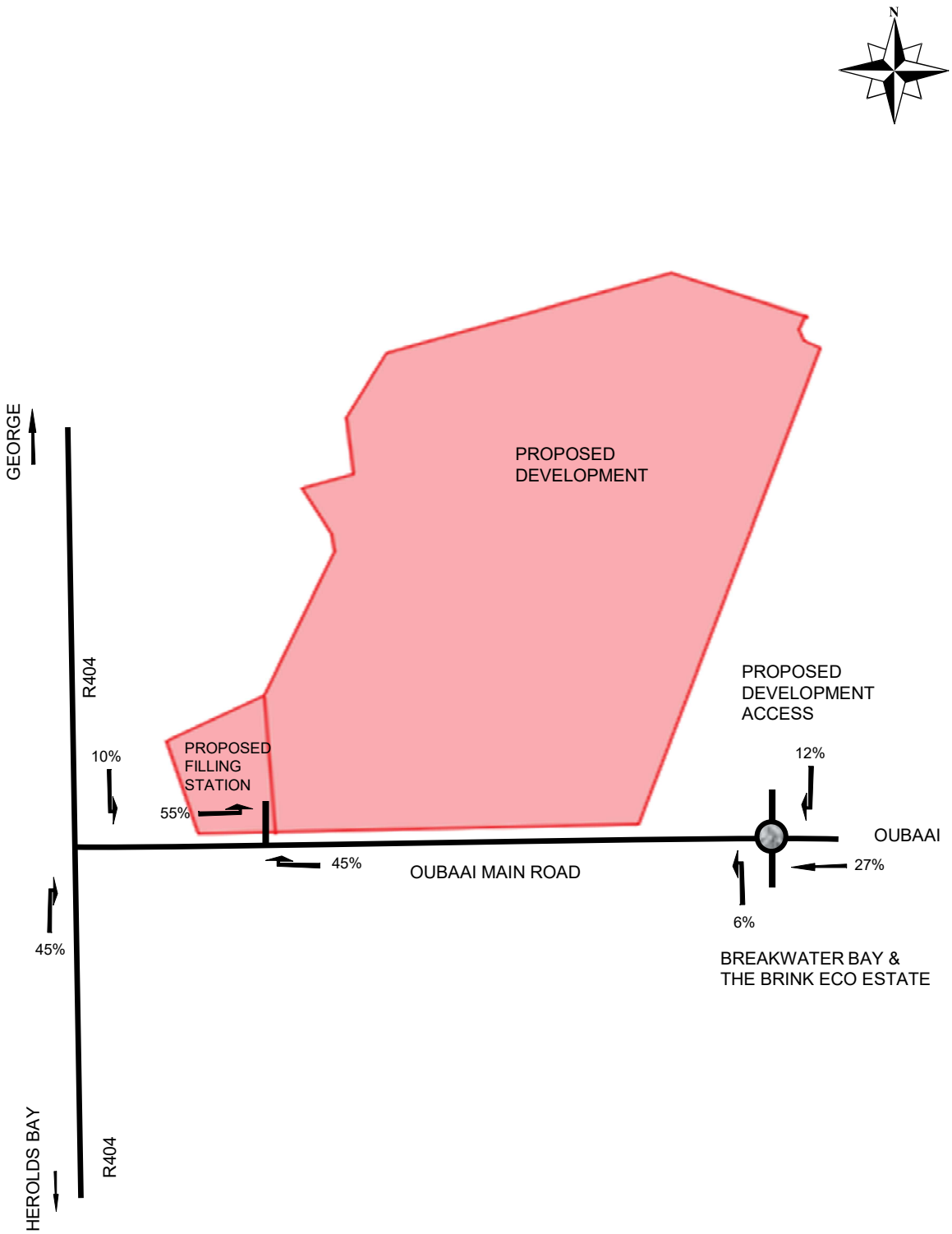
Traffic volumes



PORTION 7 OF THE FARM BUFFELSFONTEIN, HEROLDS BAY – TRAFFIC IMPACT STUDY

Trip Distribution & Assignment: Residential Estate

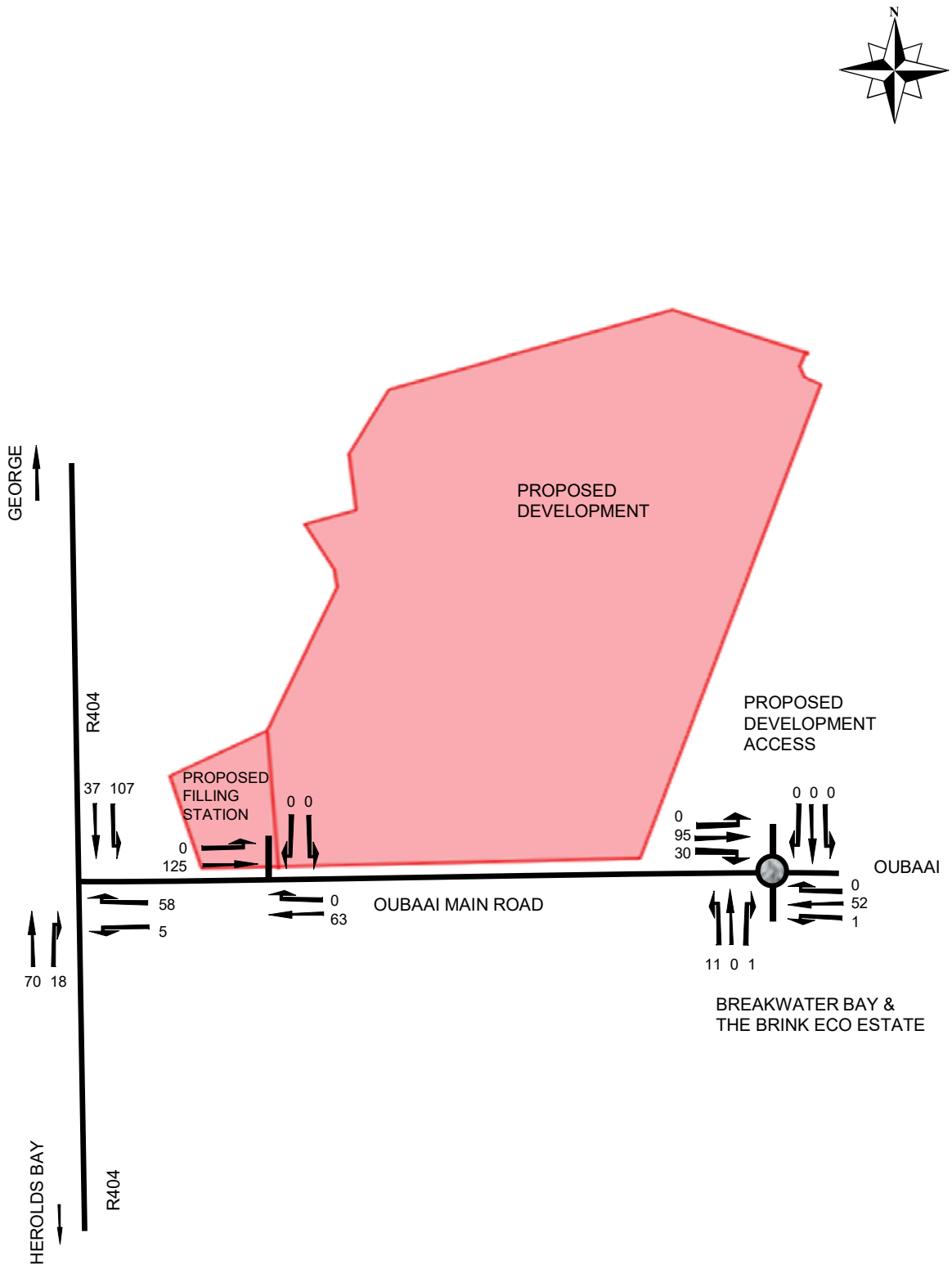
ELEMENT Consulting Engineers
A FIFTH DIMENSION TO ENGINEERING



PORTION 7 OF THE FARM BUFFELSFONTEIN, HEROLDS BAY – TRAFFIC IMPACT STUDY

Trip Distribution & Assignment: Commercial Centre

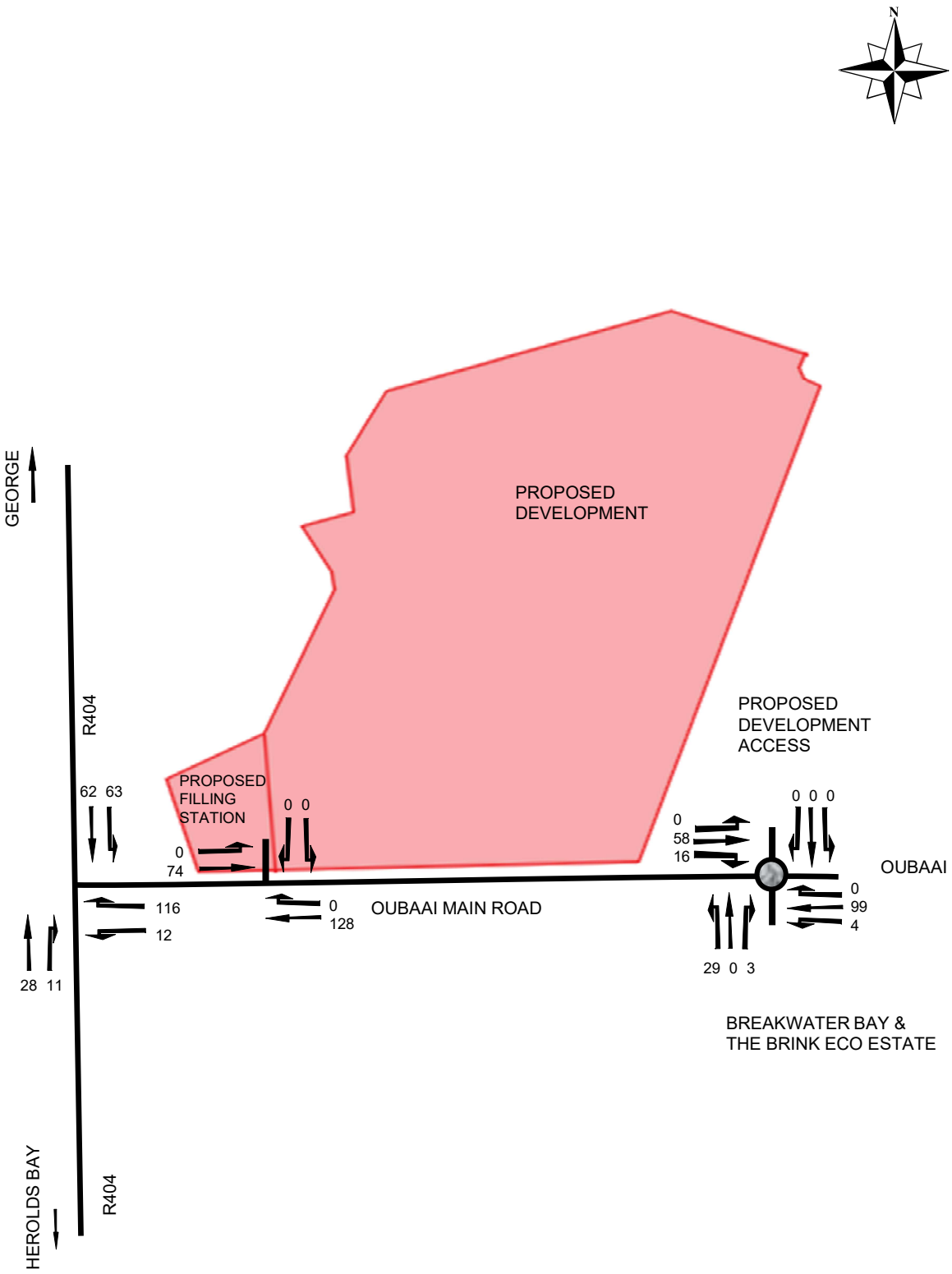
ELEMENT Consulting Engineers
A FIFTH DIMENSION TO ENGINEERING



PORTION 7 OF THE FARM BUFFELSFONTEIN, HEROLDS BAY – TRAFFIC IMPACT STUDY

ELEMENT Consulting Engineers
A FIFTH DIMENSION TO ENGINEERING

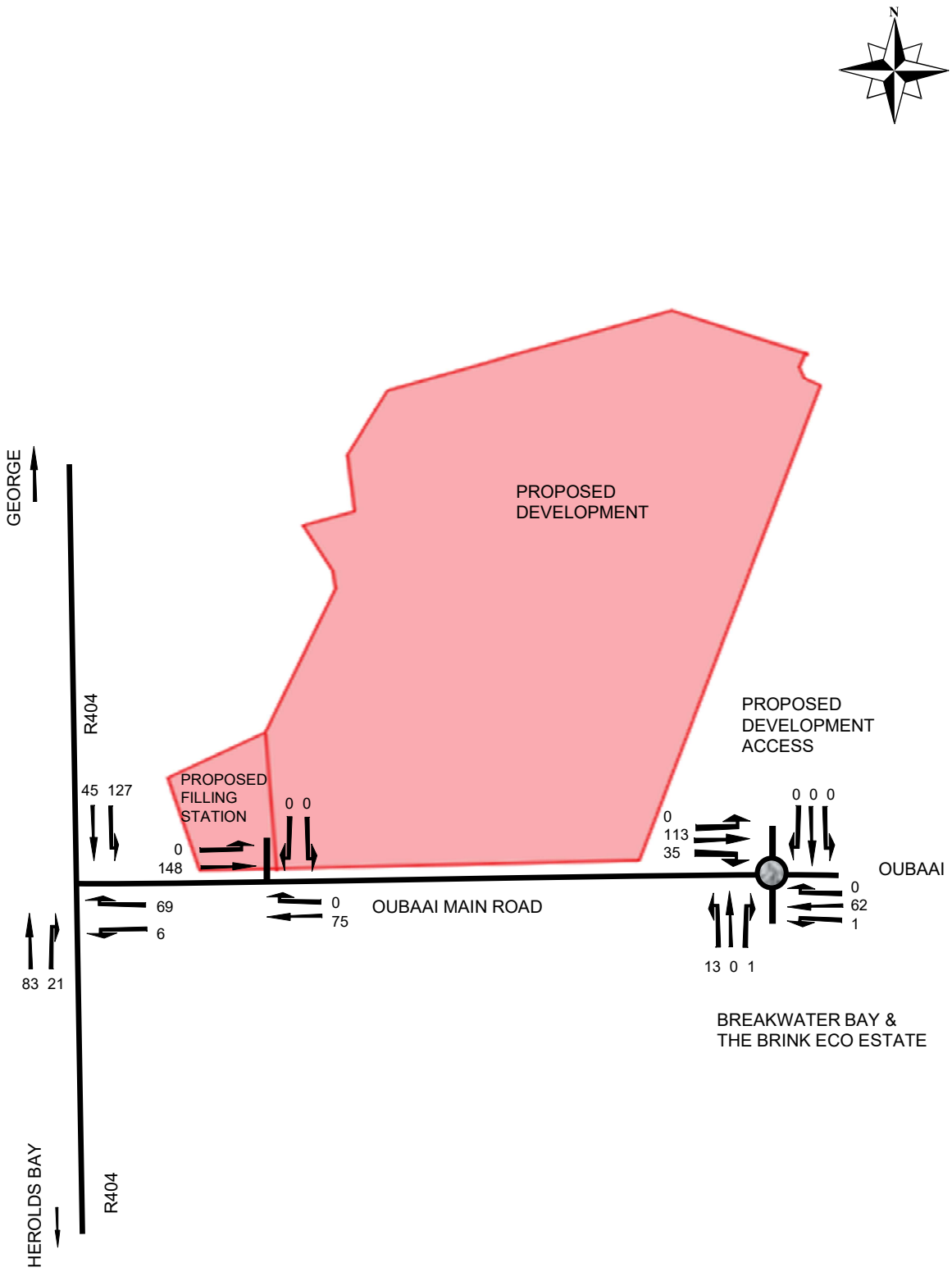
Background Traffic: 2020 base year – AM Peak Hour



PORTION 7 OF THE FARM BUFFELSFONTEIN, HEROLDS BAY – TRAFFIC IMPACT STUDY

ELEMENT Consulting Engineers
A FIFTH DIMENSION TO ENGINEERING

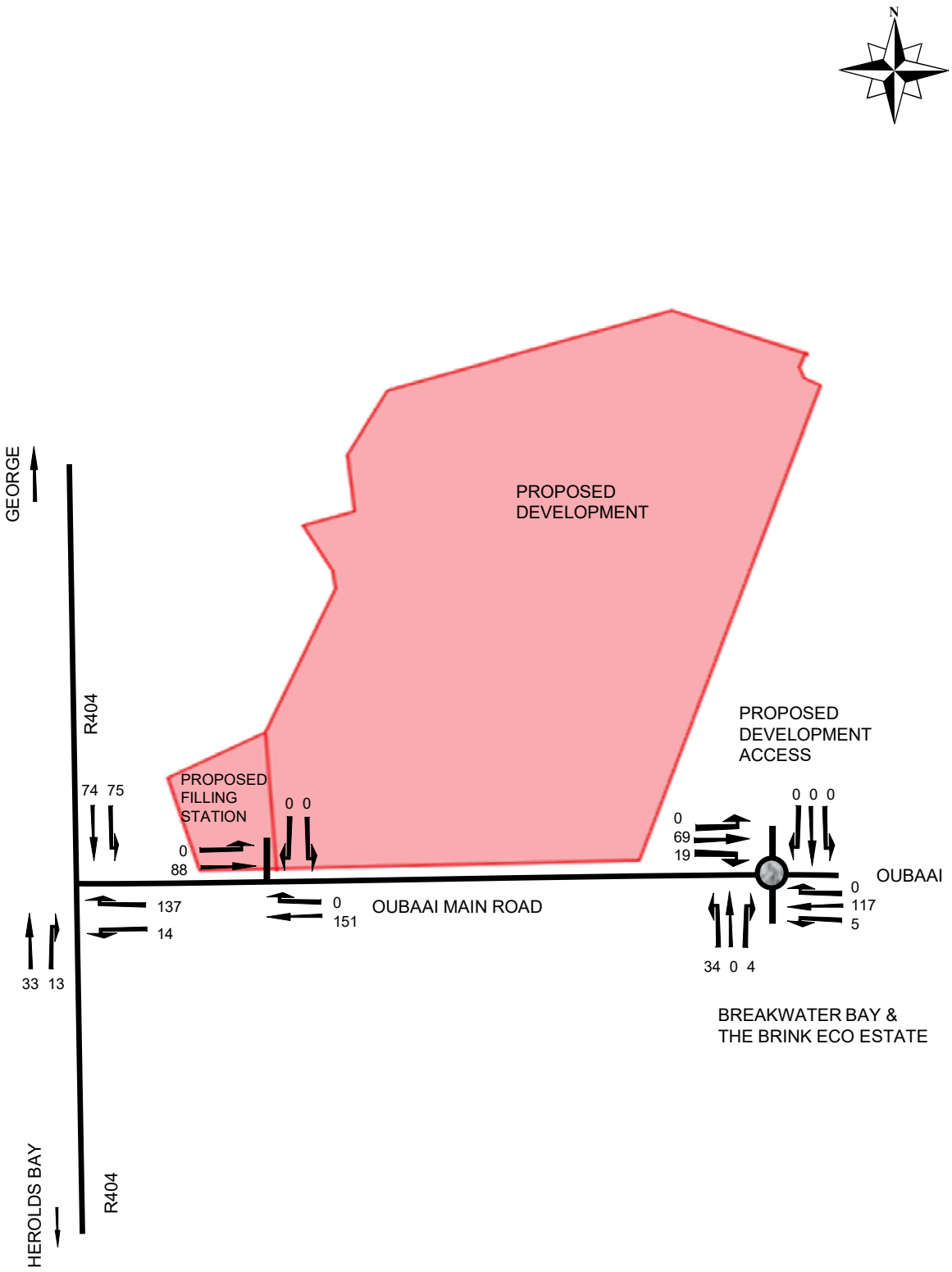
Background Traffic: 2020 base year – PM Peak Hour



PORTION 7 OF THE FARM BUFFELSFONTEIN, HEROLDS BAY – TRAFFIC IMPACT STUDY

Background Traffic: 2025 horizon year – AM Peak Hour

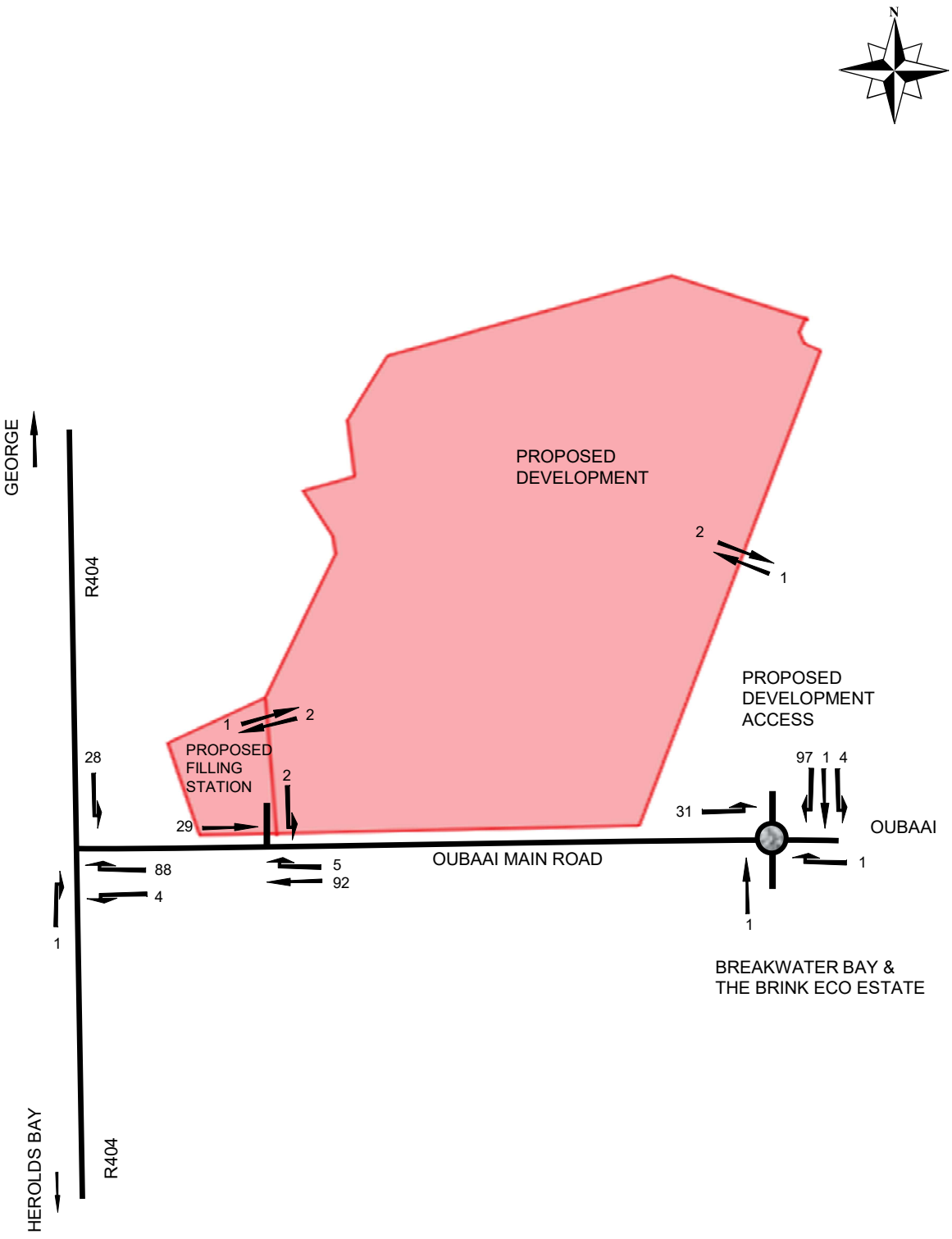
ELEMENT Consulting Engineers
A FIFTH DIMENSION TO ENGINEERING



PORTION 7 OF THE FARM BUFFELSFONTEIN, HEROLDS BAY – TRAFFIC IMPACT STUDY

Background Traffic: 2025 horizon year – PM Peak Hour

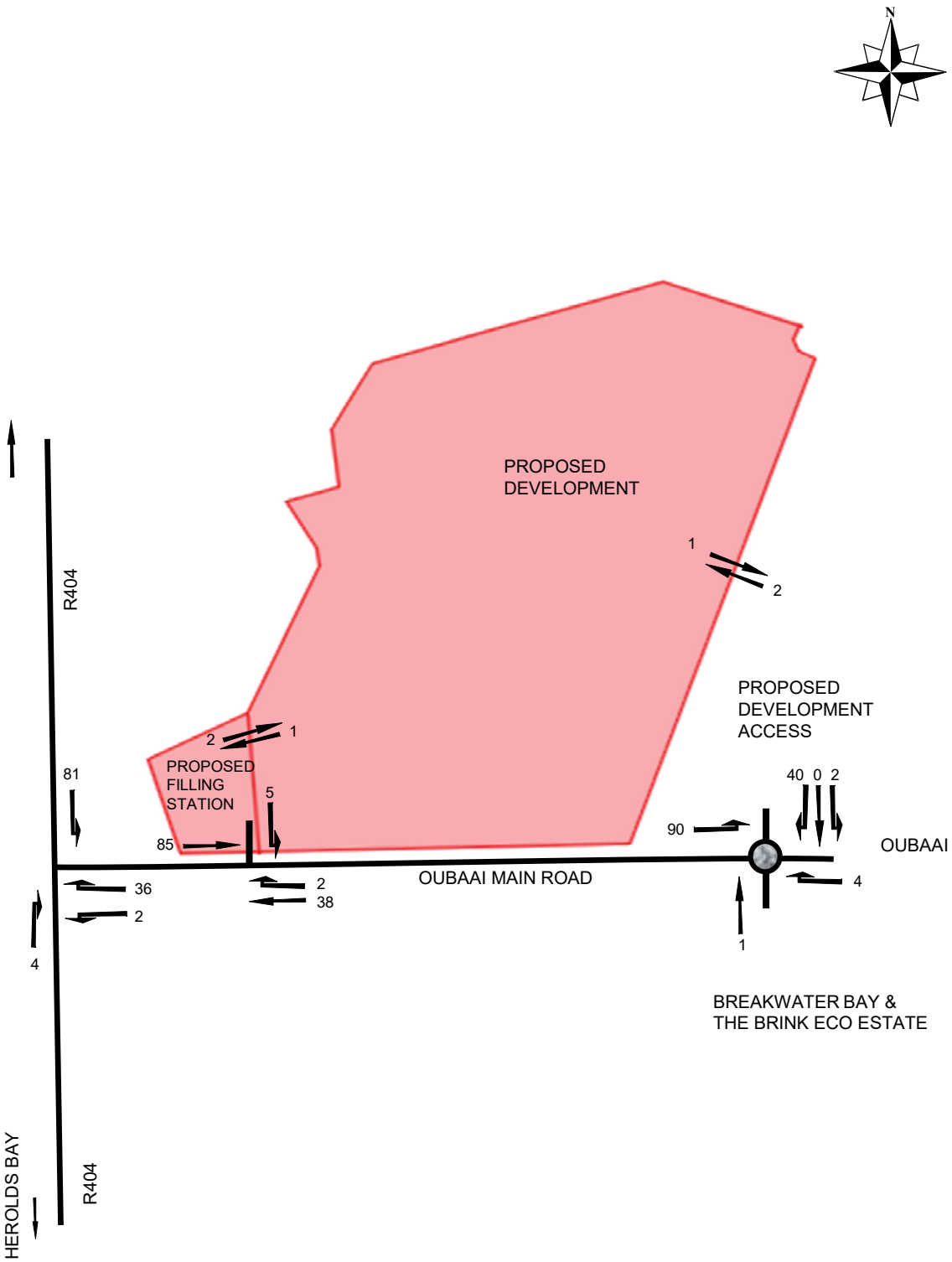
ELEMENT Consulting Engineers
A FIFTH DIMENSION TO ENGINEERING



PORTION 7 OF THE FARM BUFFELSFONTEIN, HEROLDS BAY –
TRAFFIC IMPACT STUDY

Development Traffic:
Residential Estate - AM Peak Hour

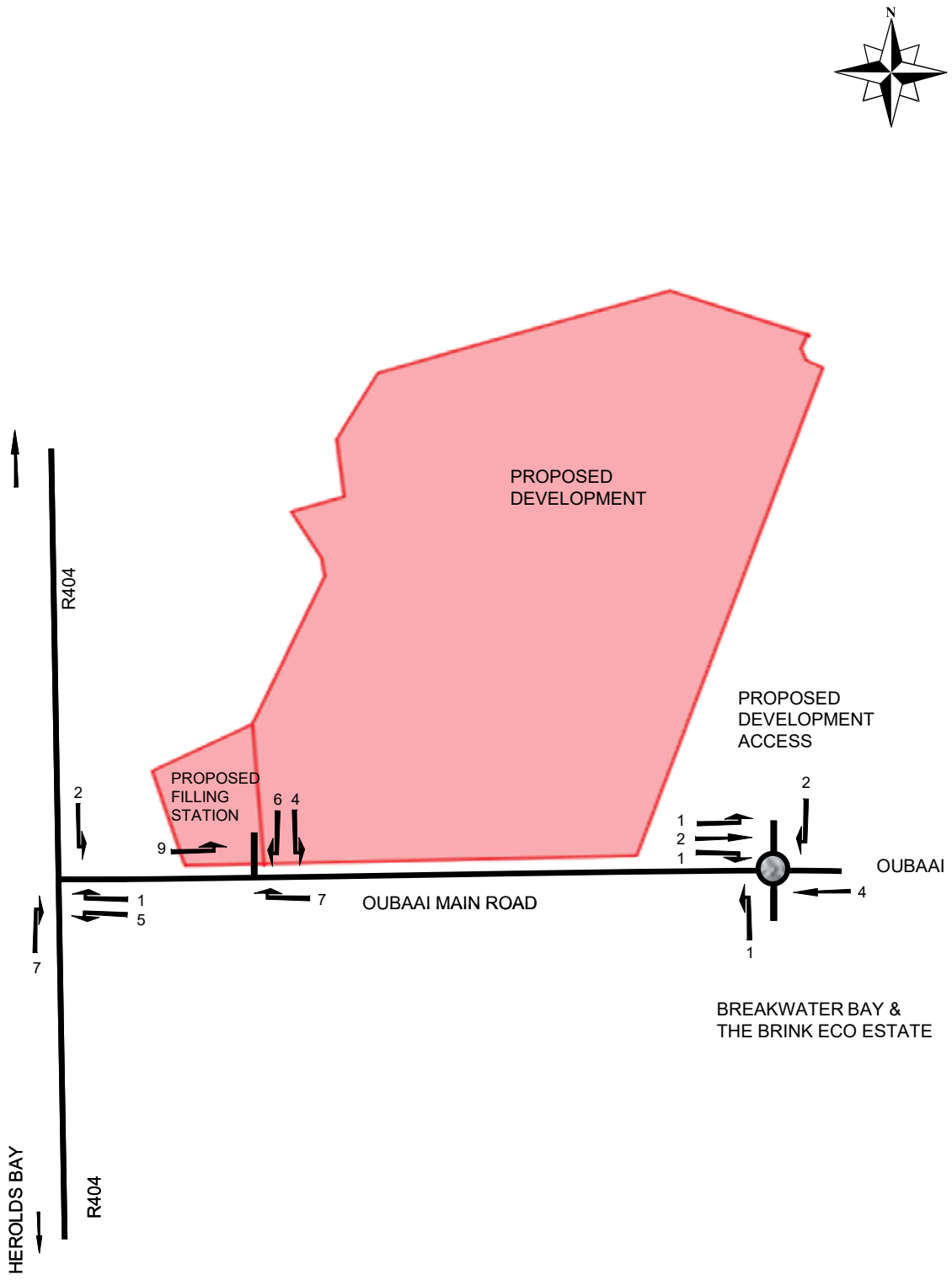
ELEMENT Consulting Engineers
A FIFTH DIMENSION TO ENGINEERING



PORTION 7 OF THE FARM BUFFELSFONTEIN, HEROLDS BAY – TRAFFIC IMPACT STUDY

Development Traffic:
Residential Estate - PM Peak Hour

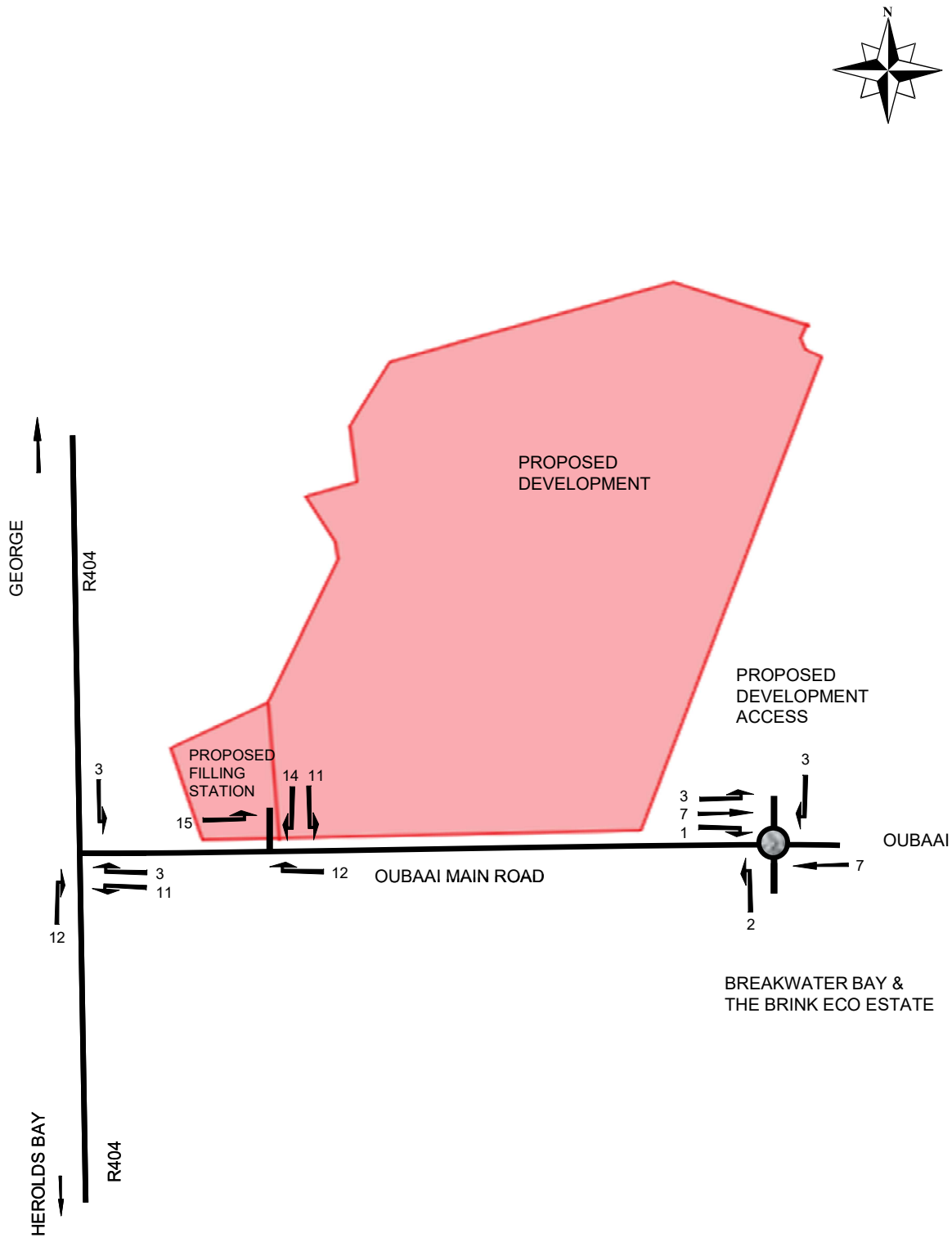
ELEMENT Consulting Engineers
A FIFTH DIMENSION TO ENGINEERING



PORTION 7 OF THE FARM BUFFELSFONTEIN, HEROLDS BAY –
TRAFFIC IMPACT STUDY

Development Traffic:
Commercial Centre - AM Peak Hour

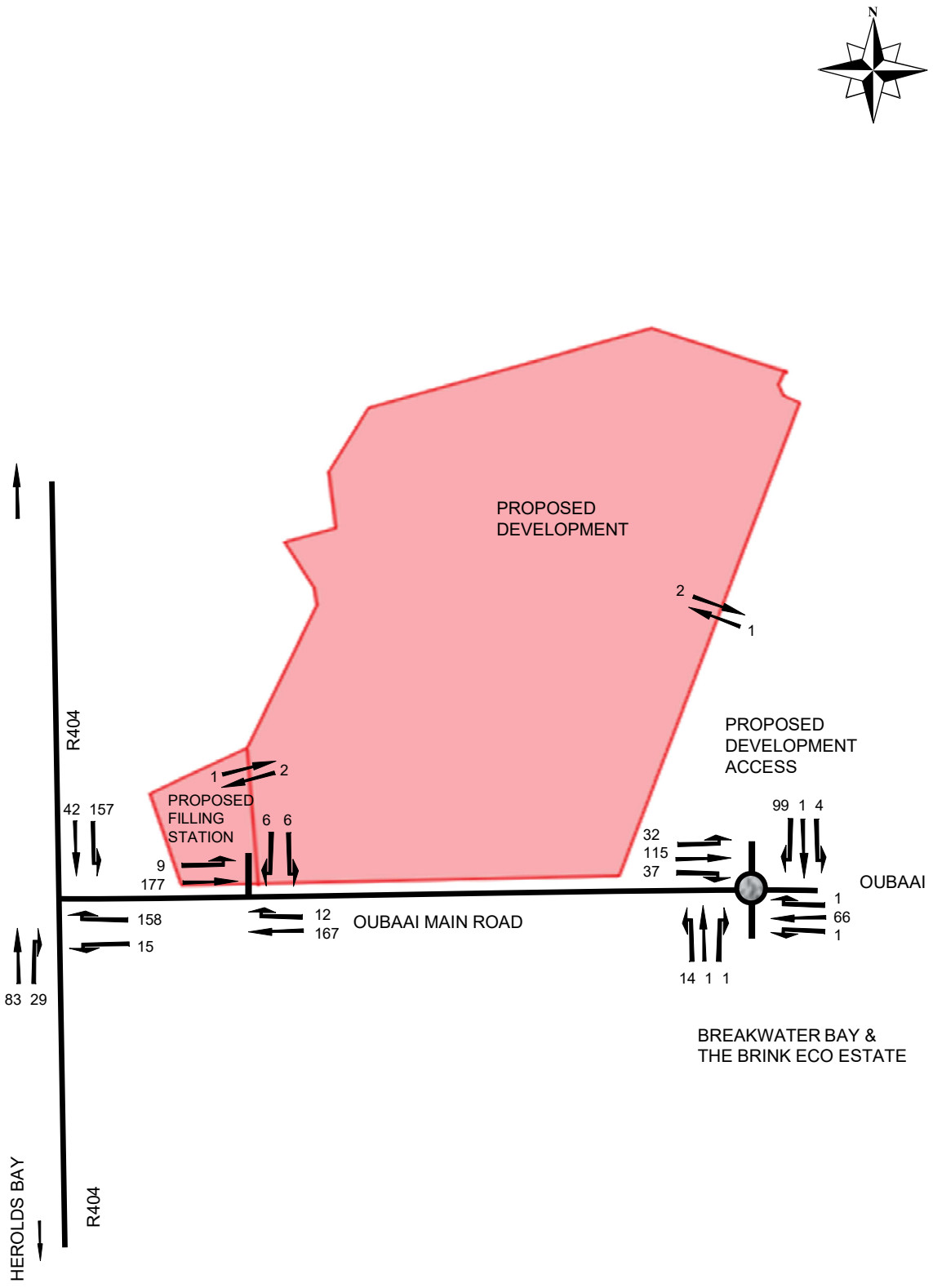
ELEMENT Consulting Engineers
A FIFTH DIMENSION TO ENGINEERING



PORTION 7 OF THE FARM BUFFELSFONTEIN, HEROLDS BAY –
TRAFFIC IMPACT STUDY

Development Traffic:
Commercial Centre - PM Peak Hour

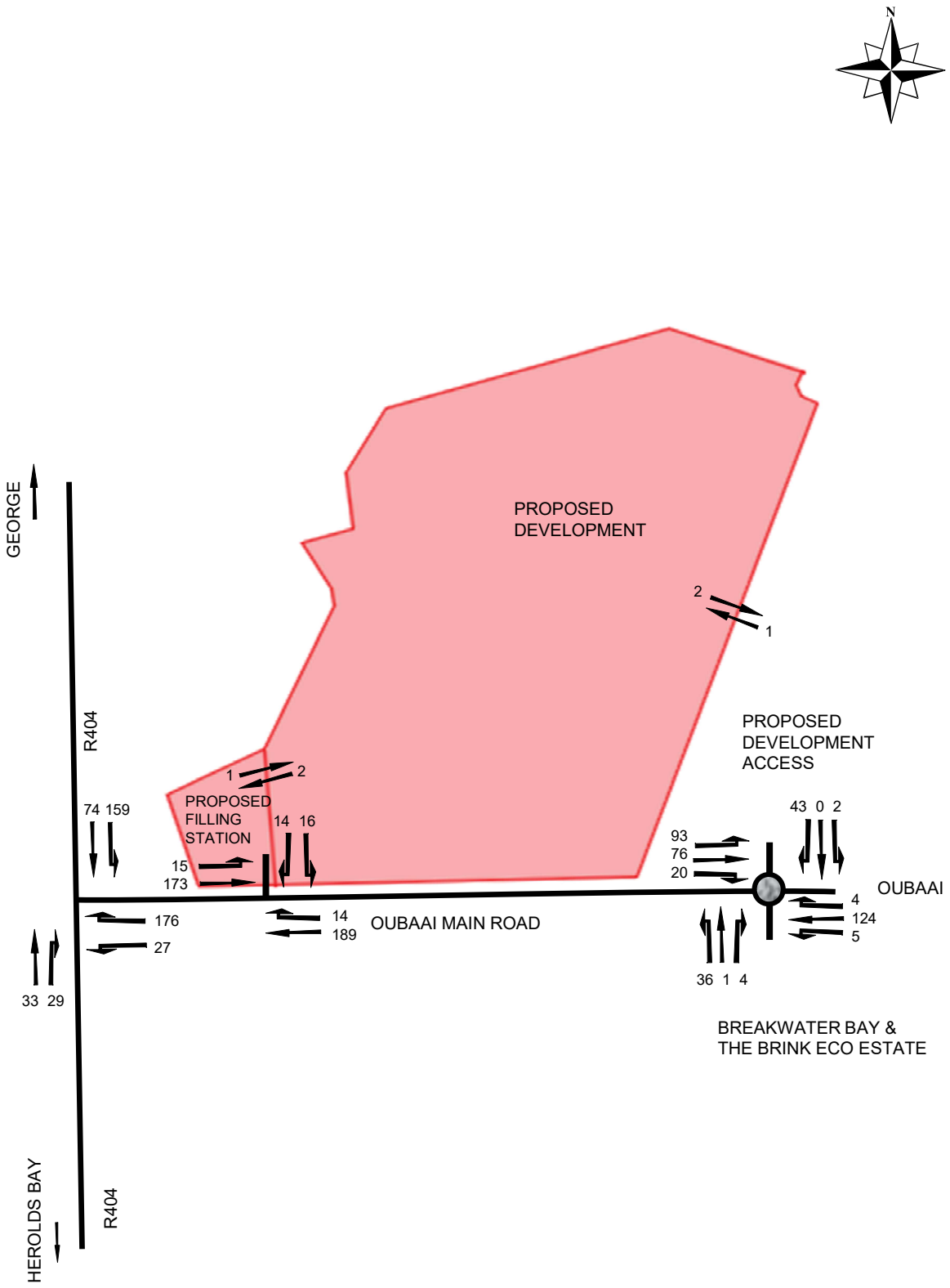
ELEMENT Consulting Engineers
A FIFTH DIMENSION TO ENGINEERING



PORTION 7 OF THE FARM BUFFELSFONTEIN, HEROLDS BAY – TRAFFIC IMPACT STUDY

ELEMENT Consulting Engineers
A FIFTH DIMENSION TO ENGINEERING

Total Traffic Demand – 2025 Horison Year: AM Peak Hour



PORTION 7 OF THE FARM BUFFELSFONTEIN, HEROLDS BAY – TRAFFIC IMPACT STUDY

Total Traffic Demand – 2025 Horison Year: PM Peak Hour

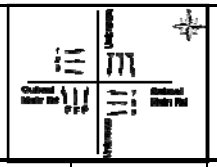
ELEMENT Consulting Engineers
A FIFTH DIMENSION TO ENGINEERING

Traffic Counts

Location: Oubaai Main Road Circle #1

Date: 2018/11/07

Surveyor: L. Venter



ELEMENT Consulting Engineers
A FIFTH DIMENSION TO ENGINEERING

	1	2	3	4	5	6		Hour	1	2	3	4	5	6	Total
06:00-06:15	3	1	1	0	0	0		06:00-07:00	13	5	27	0	1	0	46
06:15-06:30	1	0	4	0	0	0		06:15-07:15	22	6	44	0	4	0	76
06:30-06:45	2	2	5	0	0	0		06:30-07:30	33	11	54	0	6	1	105
06:45-07:00	7	2	17	0	1	0	46	06:45-07:45	56	12	61	0	9	1	139
07:00-07:15	12	2	18	0	3	0	76	07:00-08:00	84	18	54	0	10	1	167
07:15-07:30	12	5	14	0	2	1	105	07:15-08:15	80	23	46	0	9	1	159
07:30-07:45	25	3	12	0	3	0	139	07:30-08:30	86	26	49	1	10	0	172
07:45-08:00	35	8	10	0	2	0	167	07:45-08:45	78	25	56	5	12	0	176
08:00-08:15	8	7	10	0	2	0	159	08:00-09:00	66	21	61	6	15	1	170
08:15-08:30	18	8	17	1	3	0	172	08:15-09:15	74	16	61	7	15	1	174
08:30-08:45	17	2	19	4	5	0	176	08:30-09:30	64	11	60	7	12	1	155
08:45-09:00	23	4	15	1	5	1	170	08:45-09:45	57	15	61	3	12	1	149
09:00-09:15	16	2	10	1	2	0	174	09:00-10:00	47	14	63	4	11	0	139
09:15-09:30	8	3	16	1	0	0	155	09:15-10:15	51	15	66	5	15	1	153
09:30-09:45	10	6	20	0	5	0	149	09:30-10:30	53	18	61	8	18	2	160
09:45-10:00	13	3	17	2	4	0	139	09:45-10:45	53	20	57	8	19	3	160
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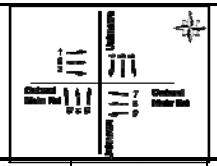
10:30-10:45	10	8	16	0	6	1	160	10:30-11:30	40	17	53	2	21	3	136
10:45-11:00	9	3	9	1	4	1	148	10:45-11:45	41	9	46	3	19	2	120
11:00-11:15	11	3	11	0	10	0	138	11:00-12:00	47	6	52	2	20	2	129
11:15-11:30	10	3	17	1	1	1	136	11:15-12:15	51	10	53	2	12	2	130
11:30-11:45	11	0	9	1	4	0	120	11:30-12:30	53	12	46	1	11	1	124
11:45-12:00	15	0	15	0	5	1	129	11:45-12:45	59	13	47	0	10	1	130

Traffic Counts

Location: Oubaai Main Road Circle #1

Date: 2018/11/07

Surveyor: L. Venter



ELEMENT Consulting Engineers
A FIFTH DIMENSION TO ENGINEERING

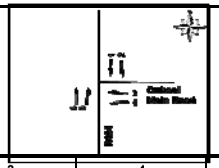
	1	2	3	4	5	6			1	2	3	4	5	6	Total
12:00-12:15	15	7	12	0	2	0		12:00-13:00	58	15	43	0	6	2	124
12:15-12:30	12	5	10	0	0	2		12:15-13:15	62	8	41	1	7	2	121
12:30-12:45	17	1	10	0	3	0		12:30-13:30	68	6	44	1	9	0	128
12:45-13:00	14	2	11	0	1	0	124	12:45-13:45	60	6	45	2	8	0	121
13:00-13:15	19	0	10	1	3	0	121	13:00-14:00	60	12	40	2	8	1	123
13:15-13:30	18	3	13	0	2	0	128	13:15-14:15	61	16	40	2	8	1	128
13:30-13:45	9	1	11	1	2	0	121	13:30-14:30	55	16	36	2	8	2	119
13:45-14:00	14	8	6	0	1	1	123	13:45-14:45	63	17	40	1	8	2	131
14:00-14:15	20	4	10	1	3	0	128	14:00-15:00	60	11	47	3	9	1	131
14:15-14:30	12	3	9	0	2	1	119	14:15-15:15	56	15	51	2	8	4	136
14:30-14:45	17	2	15	0	2	0	131	14:30-15:30	55	17	52	4	7	4	139
14:45-15:00	11	2	13	2	2	0	131	14:45-15:45	43	16	52	5	8	7	131
15:00-15:15	16	8	14	0	2	3	136	15:00-16:00	50	15	52	4	9	7	137
15:15-15:30	11	5	10	2	1	1	139	15:15-16:15	47	11	58	4	13	4	137
15:30-15:45	5	1	15	1	3	3	131	15:30-16:30	54	9	68	3	17	4	155
15:45-16:00	18	1	13	1	3	0	137	15:45-16:45	62	13	74	4	20	2	175
16:00-16:15	13	4	20	0	6	0	137	16:00-17:00	57	13	86	4	26	3	189
16:15-16:30	18	3	20	1	5	1	155	16:15-17:15	57	14	90	5	27	3	196
16:30-16:45	13	5	21	2	6	1	175	16:30-17:30	52	13	92	4	27	3	191
16:45-17:00	13	1	25	1	9	1	189	16:45-17:45	49	8	86	3	24	2	172
17:00-17:15	13	5	24	1	7	0	196	17:00-18:00	51	7	69	3	15	1	146
17:15-17:30	13	2	22	0	5	1	191								
17:30-17:45	10	0	15	1	3	0	172								
17:45-18:00	15	0	8	1	0	0	146								

Traffic Counts

Location: Oubaai Main Road T-Junction with R404

Date: 2018/11/07

Surveyor: J Cronjé



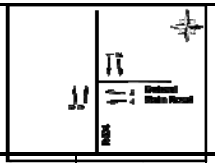
	1	2	3	4	5	6		Hour	1	2	3	4	5	6	Total
06:00-06:15	0	0	1	0	1	5		06:00-07:00	1	17	29	0	2	33	82
06:15-06:30	0	2	5	0	0	4		06:15-07:15	2	30	50	3	2	48	135
06:30-06:45	0	4	7	0	0	6		06:30-07:30	4	43	63	4	5	63	182
06:45-07:00	1	11	16	0	1	18	82	06:45-07:45	14	65	70	5	8	82	244
07:00-07:15	1	13	22	3	1	20	135	07:00-08:00	26	88	63	5	16	79	277
07:15-07:30	2	15	18	1	3	19	182	07:15-08:15	32	93	54	4	18	75	276
07:30-07:45	10	26	14	1	3	25	244	07:30-08:30	35	102	55	6	18	65	281
07:45-08:00	13	34	9	0	9	15	277	07:45-08:45	31	93	63	8	15	46	256
08:00-08:15	7	18	13	2	3	16	276	08:00-09:00	27	81	69	12	10	40	239
08:15-08:30	5	24	19	3	3	9	281	08:15-09:15	26	78	66	11	10	34	225
08:30-08:45	6	17	22	3	0	6	256	08:30-09:30	34	65	61	10	8	35	213
08:45-09:00	9	22	15	4	4	9	239	08:45-09:45	33	64	63	9	12	46	227
09:00-09:15	6	15	10	1	3	10	225	09:00-10:00	37	53	64	9	9	46	218
09:15-09:30	13	11	14	2	1	10	213	09:15-10:15	39	59	67	14	8	42	229
09:30-09:45	5	16	24	2	4	17	227	09:30-10:30	33	64	66	15	9	39	226
09:45-10:00	13	11	16	4	1	9	218	09:45-10:45	35	58	61	17	8	30	209
10:00-10:15	8	21	13	6	2	6	229	10:00-11:00	25	59	54	16	12	29	195
10:15-10:30	7	16	13	3	2	7	226	10:15-11:15	25	52	58	13	11	28	187
10:30-10:45	7	10	19	4	3	8	209	10:30-11:30	31	47	63	15	11	37	204
10:45-11:00	3	12	9	3	5	8	195	10:45-11:45	37	46	56	13	9	41	202
11:00-11:15	8	14	17	3	1	5	187	11:00-12:00	42	46	68	10	7	48	221
11:15-11:30	13	11	18	5	2	16	204	11:15-12:15	42	52	60	12	8	56	230
11:30-11:45	13	9	12	2	1	12	202	11:30-12:30	38	54	50	9	8	49	208
11:45-12:00	8	12	21	0	3	15	221	11:45-12:45	32	66	50	10	9	46	213

Traffic Counts

Location: Oubaai Main Road T-Junction with R404

Date: 2018/11/07

Surveyor: J Cronjé



ELEMENT Consulting Engineers
A FIFTH DIMENSION TO ENGINEERING

	1	2	3	4	5	6			1	2	3	4	5	6	Total
12:00-12:15	8	20	9	5	2	13		12:00-13:00	35	68	41	11	6	35	196
12:15-12:30	9	13	8	2	2	9		12:15-13:15	39	66	42	8	6	31	192
12:30-12:45	7	21	12	3	2	9		12:30-13:30	38	72	48	9	5	33	205
12:45-13:00	11	14	12	1	0	4	196	12:45-13:45	40	62	49	6	7	31	195
13:00-13:15	12	18	10	2	2	9	192	13:00-14:00	43	70	45	6	9	35	208
13:15-13:30	8	19	14	3	1	11	205	13:15-14:15	40	71	44	6	7	28	196
13:30-13:45	9	11	13	0	4	7	195	13:30-14:30	47	67	42	5	7	24	192
13:45-14:00	14	22	8	1	2	8	208	13:45-14:45	44	76	40	9	5	21	195
14:00-14:15	9	19	9	2	0	2	196	14:00-15:00	43	65	47	10	5	32	202
14:15-14:30	15	15	12	2	1	7	192	14:15-15:15	43	69	49	12	7	41	221
14:30-14:45	6	20	11	4	2	4	195	14:30-15:30	35	69	48	13	6	41	212
14:45-15:00	13	11	15	2	2	19	202	14:45-15:45	38	56	56	13	5	41	209
15:00-15:15	9	23	11	4	2	11	221	15:00-16:00	27	63	55	12	5	30	192
15:15-15:30	7	15	11	3	0	7	212	15:15-16:15	28	52	67	10	4	25	186
15:30-15:45	9	7	19	4	1	4	209	15:30-16:30	30	54	73	10	7	25	199
15:45-16:00	2	18	14	1	2	8	192	15:45-16:45	32	65	84	7	9	30	227
16:00-16:15	10	12	23	2	1	6	186	16:00-17:00	42	60	102	8	10	27	249
16:15-16:30	9	17	17	3	3	7	199	16:15-17:15	48	64	104	13	12	27	268
16:30-16:45	11	18	30	1	3	9	227	16:30-17:30	58	59	110	13	10	26	276
16:45-17:00	12	13	32	2	3	5	249	16:45-17:45	64	53	94	15	8	19	253
17:00-17:15	16	16	25	7	3	6	268	17:00-18:00	66	54	71	15	6	19	231
17:15-17:30	19	12	23	3	1	6	276								
17:30-17:45	17	12	14	3	1	2	253								
17:45-18:00	14	14	9	2	1	5	231								
12 hour volume	414	724	708	114	97	453									
total	2510														
24 hour volume	2711														

ANNEXURE C

Sidra analysis, graphics and results

MOVEMENT SUMMARY

Site: 101 [Int 1 Backgr 2020 AM]

Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: The Brink Estate Access Road												
1	L2	12	0.0	0.011	3.8	LOS A	0.1	0.4	0.20	0.48	0.20	51.3
2	T1	1	0.0	0.011	4.2	LOS A	0.1	0.4	0.20	0.48	0.20	33.5
3	R2	1	0.0	0.011	7.7	LOS A	0.1	0.4	0.20	0.48	0.20	33.9
Approach		14	0.0	0.011	4.1	LOS A	0.1	0.4	0.20	0.48	0.20	50.2
East: Oubaai Access Road												
4	L2	1	0.0	0.043	3.7	LOS A	0.2	1.6	0.15	0.43	0.15	35.8
5	T1	55	0.0	0.043	4.0	LOS A	0.2	1.6	0.15	0.43	0.15	53.0
6	R2	1	0.0	0.043	7.6	LOS A	0.2	1.6	0.15	0.43	0.15	32.7
Approach		57	0.0	0.043	4.1	LOS A	0.2	1.6	0.15	0.43	0.15	52.7
North: Herolds Bay Estate Access Road												
7	L2	1	0.0	0.003	3.1	LOS A	0.0	0.1	0.31	0.50	0.31	32.5
8	T1	1	0.0	0.003	3.6	LOS A	0.0	0.1	0.31	0.50	0.31	33.5
9	R2	1	0.0	0.003	6.9	LOS A	0.0	0.1	0.31	0.50	0.31	51.9
Approach		3	0.0	0.003	4.5	LOS A	0.0	0.1	0.31	0.50	0.31	43.8
West: Oubaai Main Road												
10	L2	1	0.0	0.081	4.3	LOS A	0.5	3.2	0.03	0.52	0.03	49.3
11	T1	100	0.0	0.081	4.6	LOS A	0.5	3.2	0.03	0.52	0.03	49.8
12	R2	32	0.0	0.081	8.2	LOS A	0.5	3.2	0.03	0.52	0.03	48.7
Approach		133	0.0	0.081	5.5	LOS A	0.5	3.2	0.03	0.52	0.03	49.6
All Vehicles		206	0.0	0.081	5.0	LOS A	0.5	3.2	0.08	0.49	0.08	50.4

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.

MOVEMENT SUMMARY

Site: 101 [Int 1 Backgr 2020 PM]

Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: The Brink Estate Access Road												
1	L2	31	0.0	0.029	4.1	LOS A	0.2	1.1	0.28	0.50	0.28	50.9
2	T1	1	0.0	0.029	4.5	LOS A	0.2	1.1	0.28	0.50	0.28	32.8
3	R2	3	0.0	0.029	8.0	LOS A	0.2	1.1	0.28	0.50	0.28	33.2
Approach		35	0.0	0.029	4.5	LOS A	0.2	1.1	0.28	0.50	0.28	50.0
East: Oubaai Access Road												
4	L2	4	0.0	0.076	3.6	LOS A	0.4	2.9	0.10	0.43	0.10	36.3
5	T1	104	0.0	0.076	3.9	LOS A	0.4	2.9	0.10	0.43	0.10	53.3
6	R2	1	0.0	0.076	7.5	LOS A	0.4	2.9	0.10	0.43	0.10	33.1
Approach		109	0.0	0.076	4.0	LOS A	0.4	2.9	0.10	0.43	0.10	52.9
North: Herolds Bay Estate Access Road												
7	L2	1	0.0	0.003	2.8	LOS A	0.0	0.1	0.24	0.50	0.24	33.0
8	T1	1	0.0	0.003	3.3	LOS A	0.0	0.1	0.24	0.50	0.24	34.0
9	R2	1	0.0	0.003	6.6	LOS A	0.0	0.1	0.24	0.50	0.24	52.2
Approach		3	0.0	0.003	4.3	LOS A	0.0	0.1	0.24	0.50	0.24	44.2
West: Oubaai Main Road												
10	L2	1	0.0	0.051	4.3	LOS A	0.3	2.0	0.05	0.51	0.05	49.3
11	T1	61	0.0	0.051	4.6	LOS A	0.3	2.0	0.05	0.51	0.05	49.9
12	R2	17	0.0	0.051	8.2	LOS A	0.3	2.0	0.05	0.51	0.05	48.8
Approach		79	0.0	0.051	5.4	LOS A	0.3	2.0	0.05	0.51	0.05	49.6
All Vehicles		226	0.0	0.076	4.5	LOS A	0.4	2.9	0.11	0.47	0.11	51.2

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.

MOVEMENT SUMMARY

Site: 101 [Int 1 Backgr 2025 AM]

Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: The Brink Estate Access Road												
1	L2	14	0.0	0.013	3.9	LOS A	0.1	0.5	0.22	0.48	0.22	51.2
2	T1	1	0.0	0.013	4.2	LOS A	0.1	0.5	0.22	0.48	0.22	33.4
3	R2	1	0.0	0.013	7.8	LOS A	0.1	0.5	0.22	0.48	0.22	33.8
Approach		16	0.0	0.013	4.1	LOS A	0.1	0.5	0.22	0.48	0.22	50.3
East: Oubaai Access Road												
4	L2	1	0.0	0.051	3.7	LOS A	0.3	1.9	0.16	0.43	0.16	35.7
5	T1	65	0.0	0.051	4.1	LOS A	0.3	1.9	0.16	0.43	0.16	52.9
6	R2	1	0.0	0.051	7.6	LOS A	0.3	1.9	0.16	0.43	0.16	32.5
Approach		67	0.0	0.051	4.1	LOS A	0.3	1.9	0.16	0.43	0.16	52.7
North: Herolds Bay Estate Access Road												
7	L2	1	0.0	0.003	3.2	LOS A	0.0	0.1	0.33	0.50	0.33	32.2
8	T1	1	0.0	0.003	3.8	LOS A	0.0	0.1	0.33	0.50	0.33	33.2
9	R2	1	0.0	0.003	7.0	LOS A	0.0	0.1	0.33	0.50	0.33	51.8
Approach		3	0.0	0.003	4.7	LOS A	0.0	0.1	0.33	0.50	0.33	43.6
West: Oubaai Main Road												
10	L2	1	0.0	0.096	4.3	LOS A	0.6	3.9	0.04	0.52	0.04	49.3
11	T1	119	0.0	0.096	4.6	LOS A	0.6	3.9	0.04	0.52	0.04	49.8
12	R2	38	0.0	0.096	8.2	LOS A	0.6	3.9	0.04	0.52	0.04	48.7
Approach		158	0.0	0.096	5.5	LOS A	0.6	3.9	0.04	0.52	0.04	49.6
All Vehicles		244	0.0	0.096	5.0	LOS A	0.6	3.9	0.09	0.49	0.09	50.4

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.

MOVEMENT SUMMARY

Site: 101 [Int 1 Backgr 2025 PM]

Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: The Brink Estate Access Road												
1	L2	36	0.0	0.035	4.2	LOS A	0.2	1.3	0.31	0.51	0.31	50.7
2	T1	1	0.0	0.035	4.6	LOS A	0.2	1.3	0.31	0.51	0.31	32.5
3	R2	4	0.0	0.035	8.1	LOS A	0.2	1.3	0.31	0.51	0.31	33.0
Approach		41	0.0	0.035	4.6	LOS A	0.2	1.3	0.31	0.51	0.31	49.8
East: Oubaai Access Road												
4	L2	5	0.0	0.090	3.6	LOS A	0.5	3.5	0.12	0.43	0.12	36.2
5	T1	123	0.0	0.090	4.0	LOS A	0.5	3.5	0.12	0.43	0.12	53.2
6	R2	1	0.0	0.090	7.5	LOS A	0.5	3.5	0.12	0.43	0.12	33.0
Approach		129	0.0	0.090	4.0	LOS A	0.5	3.5	0.12	0.43	0.12	52.9
North: Herolds Bay Estate Access Road												
7	L2	1	0.0	0.003	2.9	LOS A	0.0	0.1	0.26	0.49	0.26	32.8
8	T1	1	0.0	0.003	3.4	LOS A	0.0	0.1	0.26	0.49	0.26	33.8
9	R2	1	0.0	0.003	6.7	LOS A	0.0	0.1	0.26	0.49	0.26	52.1
Approach		3	0.0	0.003	4.3	LOS A	0.0	0.1	0.26	0.49	0.26	44.1
West: Oubaai Main Road												
10	L2	1	0.0	0.061	4.3	LOS A	0.4	2.5	0.06	0.50	0.06	49.3
11	T1	73	0.0	0.061	4.6	LOS A	0.4	2.5	0.06	0.50	0.06	49.8
12	R2	20	0.0	0.061	8.2	LOS A	0.4	2.5	0.06	0.50	0.06	48.7
Approach		94	0.0	0.061	5.4	LOS A	0.4	2.5	0.06	0.50	0.06	49.6
All Vehicles		267	0.0	0.090	4.6	LOS A	0.5	3.5	0.13	0.47	0.13	51.1

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.

MOVEMENT SUMMARY

Site: 101 [Int 1 Total 2025 AM]

Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: The Brink Estate Access Road												
1	L2	15	0.0	0.015	4.5	LOS A	0.1	0.6	0.37	0.50	0.37	50.6
2	T1	1	0.0	0.015	4.8	LOS A	0.1	0.6	0.37	0.50	0.37	32.3
3	R2	1	0.0	0.015	8.4	LOS A	0.1	0.6	0.37	0.50	0.37	32.8
Approach		17	0.0	0.015	4.7	LOS A	0.1	0.6	0.37	0.50	0.37	49.7
East: Oubaai Access Road												
4	L2	1	0.0	0.062	4.4	LOS A	0.4	2.5	0.35	0.47	0.35	33.9
5	T1	69	0.0	0.062	4.7	LOS A	0.4	2.5	0.35	0.47	0.35	51.8
6	R2	1	0.0	0.062	8.3	LOS A	0.4	2.5	0.35	0.47	0.35	30.7
Approach		72	0.0	0.062	4.8	LOS A	0.4	2.5	0.35	0.47	0.35	51.5
North: Herolds Bay Estate Access Road												
7	L2	4	0.0	0.096	3.4	LOS A	0.5	3.7	0.36	0.63	0.36	29.3
8	T1	1	0.0	0.096	3.9	LOS A	0.5	3.7	0.36	0.63	0.36	30.0
9	R2	104	0.0	0.096	7.2	LOS A	0.5	3.7	0.36	0.63	0.36	49.2
Approach		109	0.0	0.096	7.0	LOS A	0.5	3.7	0.36	0.63	0.36	48.8
West: Oubaai Main Road												
10	L2	34	0.0	0.117	4.3	LOS A	0.7	5.0	0.04	0.52	0.04	49.5
11	T1	121	0.0	0.117	4.6	LOS A	0.7	5.0	0.04	0.52	0.04	50.0
12	R2	39	0.0	0.117	8.2	LOS A	0.7	5.0	0.04	0.52	0.04	48.9
Approach		194	0.0	0.117	5.3	LOS A	0.7	5.0	0.04	0.52	0.04	49.7
All Vehicles		392	0.0	0.117	5.7	LOS A	0.7	5.0	0.20	0.54	0.20	49.8

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.

MOVEMENT SUMMARY

Site: 101 [Int 1 Total 2025 PM]

Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: The Brink Estate Access Road												
1	L2	38	0.0	0.039	4.5	LOS A	0.2	1.5	0.38	0.53	0.38	50.5
2	T1	1	0.0	0.039	4.9	LOS A	0.2	1.5	0.38	0.53	0.38	32.0
3	R2	4	0.0	0.039	8.5	LOS A	0.2	1.5	0.38	0.53	0.38	32.6
Approach		43	0.0	0.039	4.9	LOS A	0.2	1.5	0.38	0.53	0.38	49.6
East: Oubaai Access Road												
4	L2	5	0.0	0.109	3.9	LOS A	0.6	4.5	0.24	0.45	0.24	34.9
5	T1	131	0.0	0.109	4.3	LOS A	0.6	4.5	0.24	0.45	0.24	52.4
6	R2	4	0.0	0.109	7.8	LOS A	0.6	4.5	0.24	0.45	0.24	31.7
Approach		140	0.0	0.109	4.3	LOS A	0.6	4.5	0.24	0.45	0.24	51.9
North: Herolds Bay Estate Access Road												
7	L2	2	0.0	0.040	3.0	LOS A	0.2	1.5	0.28	0.60	0.28	29.7
8	T1	1	0.0	0.040	3.5	LOS A	0.2	1.5	0.28	0.60	0.28	30.5
9	R2	45	0.0	0.040	6.8	LOS A	0.2	1.5	0.28	0.60	0.28	49.6
Approach		48	0.0	0.040	6.5	LOS A	0.2	1.5	0.28	0.60	0.28	49.0
West: Oubaai Main Road												
10	L2	98	0.0	0.127	4.3	LOS A	0.8	5.4	0.07	0.50	0.07	49.8
11	T1	80	0.0	0.127	4.7	LOS A	0.8	5.4	0.07	0.50	0.07	50.3
12	R2	21	0.0	0.127	8.3	LOS A	0.8	5.4	0.07	0.50	0.07	49.1
Approach		199	0.0	0.127	4.9	LOS A	0.8	5.4	0.07	0.50	0.07	49.9
All Vehicles		431	0.0	0.127	4.9	LOS A	0.8	5.4	0.18	0.50	0.18	50.4

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.

MOVEMENT SUMMARY

Site: 102 [Int 2 Backgr 2020 AM]

Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Private Access												
1	L2	1	0.0	0.002	5.1	LOS A	0.0	0.0	0.17	0.89	0.17	10.7
3	R2	1	0.0	0.002	5.1	LOS A	0.0	0.0	0.17	0.89	0.17	49.1
Approach		2	0.0	0.002	5.1	LOS A	0.0	0.0	0.17	0.89	0.17	30.1
East: Oubaai Main Road												
4	L2	1	0.0	0.035	5.5	LOS A	0.0	0.0	0.00	0.01	0.00	57.2
5	T1	66	0.0	0.035	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.8
Approach		67	0.0	0.035	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
West: Oubaai Main Road												
11	T1	132	0.0	0.068	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
12	R2	1	0.0	0.068	5.3	LOS A	0.0	0.0	0.00	0.00	0.00	47.3
Approach		133	0.0	0.068	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles		202	0.0	0.068	0.1	NA	0.0	0.0	0.00	0.02	0.00	59.5

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.
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 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: 102 [Int 2 Backgr 2020 PM]

Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Private Access												
1	L2	1	0.0	0.002	5.3	LOS A	0.0	0.0	0.25	0.85	0.25	10.7
3	R2	1	0.0	0.002	5.2	LOS A	0.0	0.0	0.25	0.85	0.25	49.1
Approach		2	0.0	0.002	5.2	LOS A	0.0	0.0	0.25	0.85	0.25	30.1
East: Oubaai Main Road												
4	L2	1	0.0	0.070	5.5	LOS A	0.0	0.0	0.00	0.00	0.00	57.2
5	T1	135	0.0	0.070	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		136	0.0	0.070	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: Oubaai Main Road												
11	T1	78	0.0	0.041	0.0	LOS A	0.0	0.0	0.01	0.01	0.01	59.8
12	R2	1	0.0	0.041	5.5	LOS A	0.0	0.0	0.01	0.01	0.01	47.0
Approach		79	0.0	0.041	0.1	NA	0.0	0.0	0.01	0.01	0.01	59.8
All Vehicles		217	0.0	0.070	0.1	NA	0.0	0.0	0.01	0.01	0.01	59.5

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.
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 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: 102 [Int 2 Backgr 2025 AM]

Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Private Access												
1	L2	1	0.0	0.002	5.1	LOS A	0.0	0.0	0.19	0.88	0.19	10.7
3	R2	1	0.0	0.002	5.3	LOS A	0.0	0.0	0.19	0.88	0.19	49.0
Approach		2	0.0	0.002	5.2	LOS A	0.0	0.0	0.19	0.88	0.19	30.1
East: Oubaai Main Road												
4	L2	1	0.0	0.041	5.5	LOS A	0.0	0.0	0.00	0.01	0.00	57.2
5	T1	79	0.0	0.041	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.9
Approach		80	0.0	0.041	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
West: Oubaai Main Road												
11	T1	156	0.0	0.081	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
12	R2	1	0.0	0.081	5.3	LOS A	0.0	0.0	0.00	0.00	0.00	47.3
Approach		157	0.0	0.081	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles		239	0.0	0.081	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.6

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.
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 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: 102 [Int 2 Backgr 2025 PM]

Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Private Access												
1	L2	1	0.0	0.002	5.4	LOS A	0.0	0.0	0.27	0.84	0.27	10.6
3	R2	1	0.0	0.002	5.3	LOS A	0.0	0.0	0.27	0.84	0.27	48.9
Approach		2	0.0	0.002	5.4	LOS A	0.0	0.0	0.27	0.84	0.27	30.0
East: Oubaai Main Road												
4	L2	1	0.0	0.083	5.5	LOS A	0.0	0.0	0.00	0.00	0.00	57.3
5	T1	160	0.0	0.083	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		161	0.0	0.083	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: Oubaai Main Road												
11	T1	93	0.0	0.048	0.0	LOS A	0.0	0.1	0.01	0.01	0.01	59.9
12	R2	1	0.0	0.048	5.6	LOS A	0.0	0.1	0.01	0.01	0.01	47.1
Approach		94	0.0	0.048	0.1	NA	0.0	0.1	0.01	0.01	0.01	59.8
All Vehicles		257	0.0	0.083	0.1	NA	0.0	0.1	0.00	0.01	0.00	59.6

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.
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 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: 102 [Int 2 Total 2025 AM]

Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Private Access												
1	L2	1	0.0	0.004	5.5	LOS A	0.0	0.1	0.35	0.87	0.35	10.4
2	T1	1	0.0	0.004	6.4	LOS A	0.0	0.1	0.35	0.87	0.35	6.4
3	R2	1	0.0	0.004	6.6	LOS A	0.0	0.1	0.35	0.87	0.35	48.2
Approach		3	0.0	0.004	6.2	LOS A	0.0	0.1	0.35	0.87	0.35	22.4
East: Oubaai Main Road												
4	L2	1	0.0	0.099	6.2	LOS A	0.1	0.7	0.05	0.04	0.05	56.3
5	T1	176	0.0	0.099	0.1	LOS A	0.1	0.7	0.05	0.04	0.05	59.0
6	R2	13	0.0	0.099	6.1	LOS A	0.1	0.7	0.05	0.04	0.05	55.3
Approach		189	0.0	0.099	0.5	NA	0.1	0.7	0.05	0.04	0.05	58.7
North: Commercial Access												
7	L2	6	0.0	0.016	6.0	LOS A	0.1	0.4	0.34	0.87	0.34	48.6
8	T1	1	0.0	0.016	6.9	LOS A	0.1	0.4	0.34	0.87	0.34	20.2
9	R2	6	0.0	0.016	7.2	LOS A	0.1	0.4	0.34	0.87	0.34	11.0
Approach		14	0.0	0.016	6.6	LOS A	0.1	0.4	0.34	0.87	0.34	29.6
West: Oubaai Main Road												
10	L2	9	0.0	0.101	5.2	LOS A	0.0	0.1	0.01	0.03	0.01	11.0
11	T1	186	0.0	0.101	0.0	LOS A	0.0	0.1	0.01	0.03	0.01	59.5
12	R2	1	0.0	0.101	5.7	LOS A	0.0	0.1	0.01	0.03	0.01	46.0
Approach		197	0.0	0.101	0.3	NA	0.0	0.1	0.01	0.03	0.01	56.9
All Vehicles		403	0.0	0.101	0.6	NA	0.1	0.7	0.04	0.07	0.04	56.5

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.
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 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: 102 [Int 2 Total 2025 PM]

Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Private Access												
1	L2	1	0.0	0.004	5.6	LOS A	0.0	0.1	0.37	0.87	0.37	10.4
2	T1	1	0.0	0.004	6.6	LOS A	0.0	0.1	0.37	0.87	0.37	6.4
3	R2	1	0.0	0.004	6.9	LOS A	0.0	0.1	0.37	0.87	0.37	48.0
Approach		3	0.0	0.004	6.4	LOS A	0.0	0.1	0.37	0.87	0.37	22.3
East: Oubaai Main Road												
4	L2	1	0.0	0.113	6.2	LOS A	0.1	0.8	0.05	0.04	0.05	56.3
5	T1	199	0.0	0.113	0.1	LOS A	0.1	0.8	0.05	0.04	0.05	58.9
6	R2	15	0.0	0.113	6.1	LOS A	0.1	0.8	0.05	0.04	0.05	55.2
Approach		215	0.0	0.113	0.5	NA	0.1	0.8	0.05	0.04	0.05	58.7
North: Commercial Access												
7	L2	17	0.0	0.038	6.0	LOS A	0.1	0.9	0.34	0.88	0.34	48.5
8	T1	1	0.0	0.038	7.2	LOS A	0.1	0.9	0.34	0.88	0.34	20.1
9	R2	15	0.0	0.038	7.5	LOS A	0.1	0.9	0.34	0.88	0.34	11.0
Approach		33	0.0	0.038	6.7	LOS A	0.1	0.9	0.34	0.88	0.34	30.9
West: Oubaai Main Road												
10	L2	16	0.0	0.103	5.2	LOS A	0.0	0.1	0.01	0.05	0.01	11.0
11	T1	182	0.0	0.103	0.0	LOS A	0.0	0.1	0.01	0.05	0.01	59.2
12	R2	1	0.0	0.103	5.8	LOS A	0.0	0.1	0.01	0.05	0.01	45.1
Approach		199	0.0	0.103	0.4	NA	0.0	0.1	0.01	0.05	0.01	55.0
All Vehicles		449	0.0	0.113	1.0	NA	0.1	0.9	0.06	0.11	0.06	54.6

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.
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 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: 103 [Int 3 Backgr 2020 AM]

Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Rooidraai Road												
2	T1	74	0.0	0.048	0.1	LOS A	0.1	0.8	0.12	0.12	0.12	58.1
3	R2	19	0.0	0.048	5.9	LOS A	0.1	0.8	0.12	0.12	0.12	55.4
Approach		93	0.0	0.048	1.3	NA	0.1	0.8	0.12	0.12	0.12	57.5
East: Oubaai Main Road												
4	L2	5	0.0	0.067	8.2	LOS A	0.2	1.6	0.22	0.90	0.22	50.1
6	R2	61	0.0	0.067	8.3	LOS A	0.2	1.6	0.22	0.90	0.22	51.3
Approach		66	0.0	0.067	8.3	LOS A	0.2	1.6	0.22	0.90	0.22	51.3
North: R404												
7	L2	113	0.0	0.077	5.5	LOS A	0.0	0.0	0.00	0.44	0.00	54.8
8	T1	39	0.0	0.077	0.0	LOS A	0.0	0.0	0.00	0.44	0.00	55.3
Approach		152	0.0	0.077	4.1	NA	0.0	0.0	0.00	0.44	0.00	54.9
All Vehicles		311	0.0	0.077	4.2	NA	0.2	1.6	0.08	0.44	0.08	54.6

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.
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 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: 103 [Int 3 Backgr 2020 PM]

Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Rooidraai Road												
2	T1	29	0.0	0.022	0.2	LOS A	0.1	0.5	0.14	0.16	0.14	57.5
3	R2	12	0.0	0.022	5.8	LOS A	0.1	0.5	0.14	0.16	0.14	54.9
Approach		41	0.0	0.022	1.8	NA	0.1	0.5	0.14	0.16	0.14	56.7
East: Oubaai Main Road												
4	L2	13	0.0	0.129	8.3	LOS A	0.5	3.2	0.23	0.90	0.23	50.3
6	R2	122	0.0	0.129	8.1	LOS A	0.5	3.2	0.23	0.90	0.23	51.4
Approach		135	0.0	0.129	8.1	LOS A	0.5	3.2	0.23	0.90	0.23	51.4
North: R404												
7	L2	66	0.0	0.066	5.5	LOS A	0.0	0.0	0.00	0.30	0.00	55.9
8	T1	65	0.0	0.066	0.0	LOS A	0.0	0.0	0.00	0.30	0.00	56.7
Approach		132	0.0	0.066	2.8	NA	0.0	0.0	0.00	0.30	0.00	56.2
All Vehicles		307	0.0	0.129	5.0	NA	0.5	3.2	0.12	0.54	0.12	53.9

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.
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 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: 103 [Int 3 Backgr 2025 AM]

Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Rooidraai Road												
2	T1	87	0.0	0.057	0.2	LOS A	0.1	1.0	0.13	0.12	0.13	58.0
3	R2	22	0.0	0.057	6.0	LOS A	0.1	1.0	0.13	0.12	0.13	55.4
Approach		109	0.0	0.057	1.4	NA	0.1	1.0	0.13	0.12	0.13	57.5
East: Oubaai Main Road												
4	L2	6	0.0	0.082	8.2	LOS A	0.3	2.0	0.25	0.91	0.25	50.0
6	R2	73	0.0	0.082	8.5	LOS A	0.3	2.0	0.25	0.91	0.25	51.2
Approach		79	0.0	0.082	8.5	LOS A	0.3	2.0	0.25	0.91	0.25	51.2
North: R404												
7	L2	134	0.0	0.092	5.5	LOS A	0.0	0.0	0.00	0.43	0.00	54.8
8	T1	47	0.0	0.092	0.0	LOS A	0.0	0.0	0.00	0.43	0.00	55.3
Approach		181	0.0	0.092	4.1	NA	0.0	0.0	0.00	0.43	0.00	54.9
All Vehicles		369	0.0	0.092	4.2	NA	0.3	2.0	0.09	0.44	0.09	54.6

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.
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 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: 103 [Int 3 Backgr 2025 PM]

Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Rooidraai Road												
2	T1	35	0.0	0.026	0.2	LOS A	0.1	0.6	0.16	0.17	0.16	57.4
3	R2	14	0.0	0.026	5.9	LOS A	0.1	0.6	0.16	0.17	0.16	54.8
Approach		48	0.0	0.026	1.8	NA	0.1	0.6	0.16	0.17	0.16	56.7
East: Oubaai Main Road												
4	L2	15	0.0	0.158	8.3	LOS A	0.6	4.0	0.26	0.90	0.26	50.2
6	R2	145	0.0	0.158	8.3	LOS A	0.6	4.0	0.26	0.90	0.26	51.4
Approach		160	0.0	0.158	8.3	LOS A	0.6	4.0	0.26	0.90	0.26	51.3
North: R404												
7	L2	79	0.0	0.078	5.5	LOS A	0.0	0.0	0.00	0.30	0.00	55.9
8	T1	78	0.0	0.078	0.0	LOS A	0.0	0.0	0.00	0.30	0.00	56.7
Approach		157	0.0	0.078	2.8	NA	0.0	0.0	0.00	0.30	0.00	56.2
All Vehicles		365	0.0	0.158	5.1	NA	0.6	4.0	0.13	0.54	0.13	53.9

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.
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 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: 103 [Int 3 Total 2025 AM]

Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	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	Aver. No. Cycles	Average Speed km/h
South: Rooidraai Road												
2	T1	87	0.0	0.064	0.3	LOS A	0.2	1.4	0.18	0.16	0.18	57.4
3	R2	31	0.0	0.064	6.1	LOS A	0.2	1.4	0.18	0.16	0.18	54.9
Approach		118	0.0	0.064	1.8	NA	0.2	1.4	0.18	0.16	0.18	56.8
East: Oubaai Main Road												
4	L2	16	0.0	0.193	8.2	LOS A	0.7	5.0	0.28	0.92	0.28	49.9
6	R2	166	0.0	0.193	8.8	LOS A	0.7	5.0	0.28	0.92	0.28	51.1
Approach		182	0.0	0.193	8.7	LOS A	0.7	5.0	0.28	0.92	0.28	51.0
North: R404												
7	L2	165	0.0	0.106	5.6	LOS A	0.0	0.0	0.00	0.46	0.00	54.5
8	T1	44	0.0	0.106	0.0	LOS A	0.0	0.0	0.00	0.46	0.00	55.1
Approach		209	0.0	0.106	4.4	NA	0.0	0.0	0.00	0.46	0.00	54.6
All Vehicles		509	0.0	0.193	5.3	NA	0.7	5.0	0.14	0.55	0.14	53.6

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.
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 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: 103 [Int 3 Total 2025 PM]

Site Category: (None)
Stop (Two-Way)

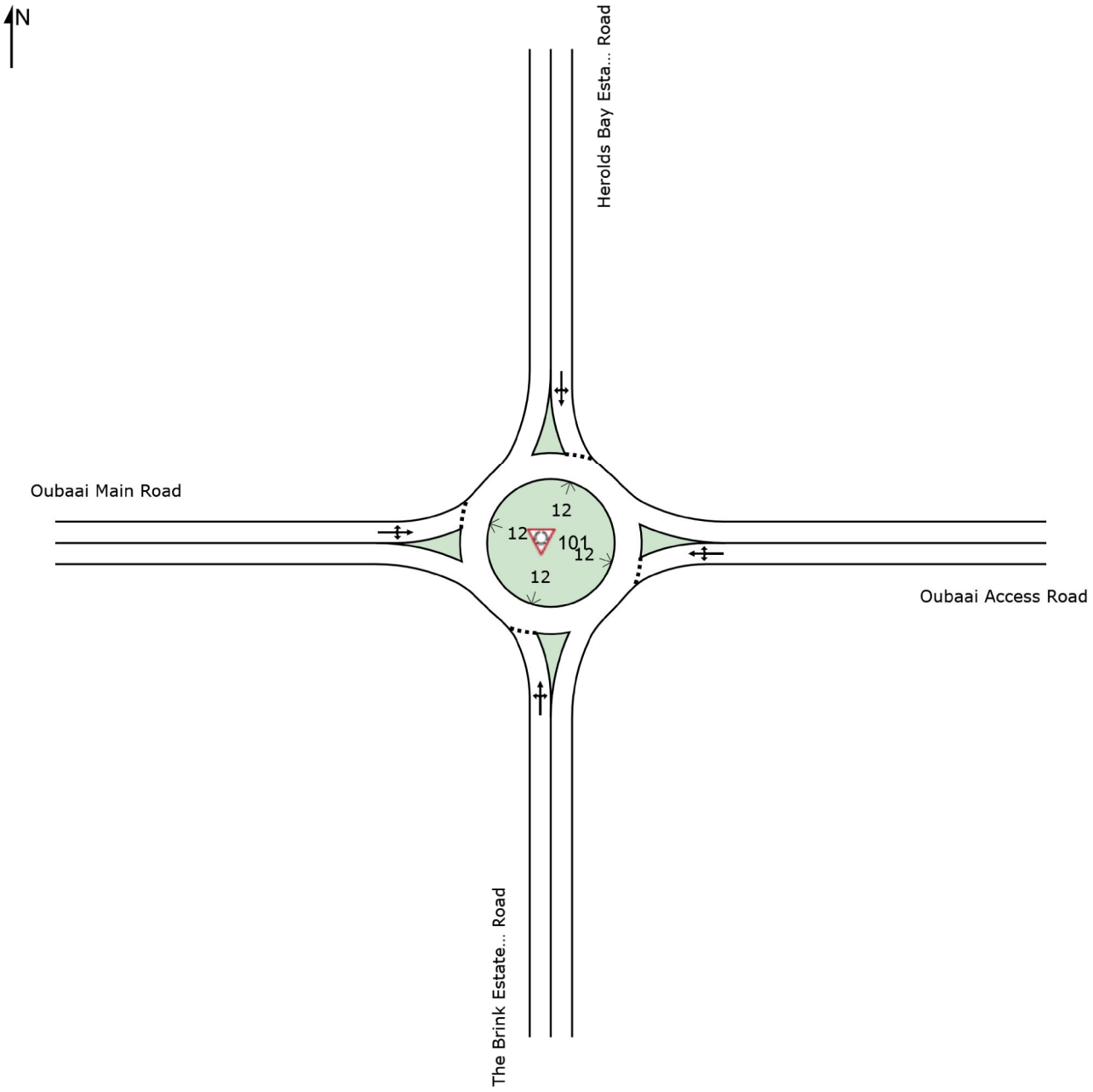
Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Rooidraai Road												
2	T1	35	0.0	0.039	0.6	LOS A	0.2	1.2	0.29	0.28	0.29	55.7
3	R2	31	0.0	0.039	6.2	LOS A	0.2	1.2	0.29	0.28	0.29	53.3
Approach		65	0.0	0.039	3.2	NA	0.2	1.2	0.29	0.28	0.29	54.6
East: Oubaai Main Road												
4	L2	28	0.0	0.220	8.4	LOS A	0.8	5.9	0.30	0.91	0.30	49.9
6	R2	185	0.0	0.220	8.7	LOS A	0.8	5.9	0.30	0.91	0.30	51.2
Approach		214	0.0	0.220	8.7	LOS A	0.8	5.9	0.30	0.91	0.30	51.0
North: R404												
7	L2	167	0.0	0.124	5.6	LOS A	0.0	0.0	0.00	0.40	0.00	55.0
8	T1	78	0.0	0.124	0.0	LOS A	0.0	0.0	0.00	0.40	0.00	55.7
Approach		245	0.0	0.124	3.8	NA	0.0	0.0	0.00	0.40	0.00	55.2
All Vehicles		524	0.0	0.220	5.7	NA	0.8	5.9	0.16	0.59	0.16	53.3

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.
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 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.

SITE LAYOUT

Site: 101 [Int 1 Backgr 2020 AM]

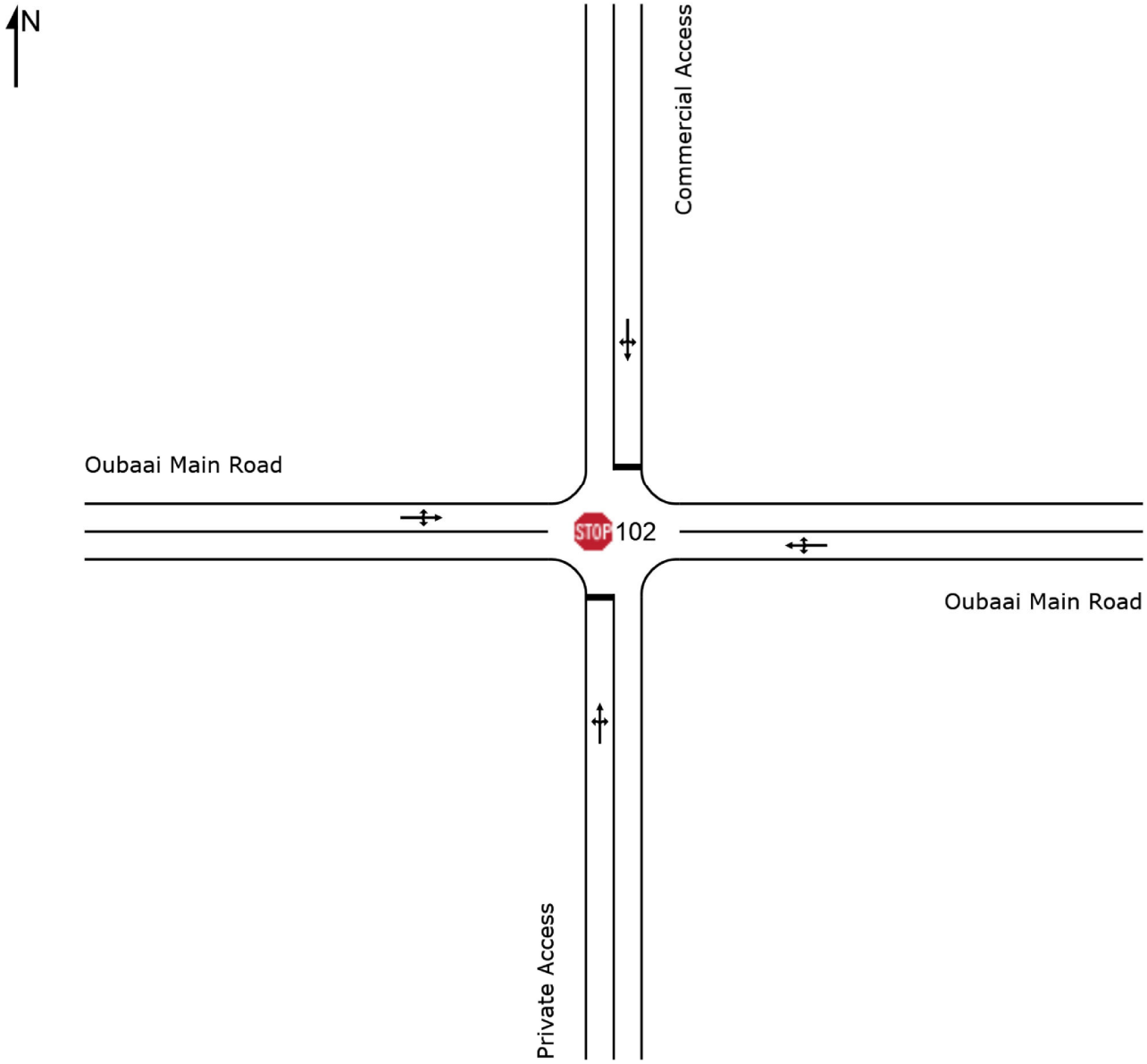
Site Category: (None)
Roundabout



SITE LAYOUT

Site: 102 [Int 2 Total 2025 AM]

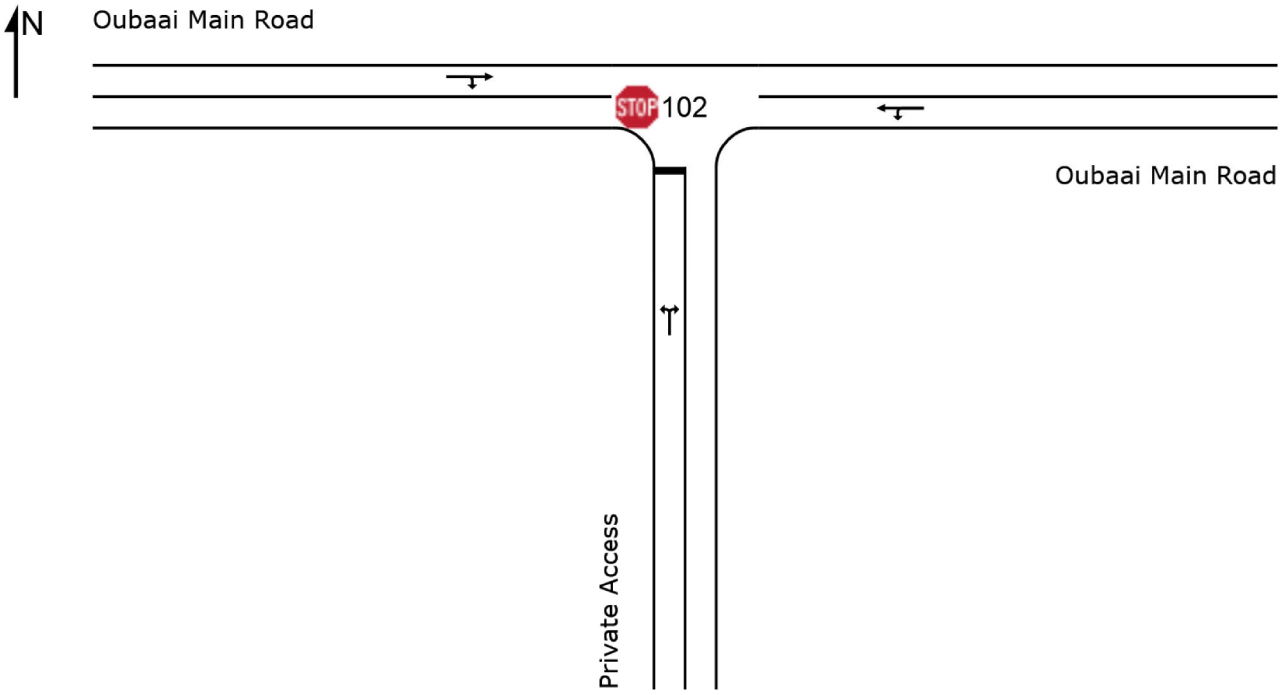
Site Category: (None)
Stop (Two-Way)



SITE LAYOUT

Site: 102 [Int 2 Backgr 2020 AM]

Site Category: (None)
Stop (Two-Way)



Organisation: ELEMENT CONSULTING ENGINEERS | Created: 10 March 2020 13:47:57
Project: P:\2017\1701561 - Herolds Bay Estate\B - Reports\Traffic Impact Assessment\Sidra\1701561 Heroldsbaai Landgoed TIA Intersection 2.sip8

SITE LAYOUT

Site: 103 [Int 3 Backgr 2020 AM]

Site Category: (None)
Stop (Two-Way)