

TRAFFIC IMPACT STUDY

PROPOSED N14 TOWNSHIP ESTABLISHMENT

ON

FARM PORTIONS 205 & 206 ELANDSKUIL

Rev 0

DEC 2017

REF: 1712 – VNDP

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This Traffic Impact Study for was prepared, checked, approved and issued to Department of Public Works & Roads: North West Provincial Government for approval.

Site: N14 Township on Farm Ptn's 205 and 206 Elandskuil

Issue No: 1


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I. Introduction

1.1. Background and executive summary

Mosoane Civils (Pty) Ltd (MSN Civils) has appointed by Mamphela Development Planners to undertake the Traffic Impact Study for proposed N14 Township development on Farm Portions 205 and 206 Elandskuil IP.

Mamphela Development Planners were appointed by Housing Development Agency("HDA") to carry out a detailed Township establishment for the creation of an Integrated and Sustainable Human Settlement on the farms: Elandskuil No. 205 IP and Elandskuil No. 206, IP, North-West Province within the JB Marks Local Municipality in Ventersdorp.

This report is prepared to support the Township Establishment Application that is submitted for approval by JB Marks Local Municipality in Ventersdorp area which is one of the four Local Municipalities of Dr. Kenneth Kaunda District Municipality.

The development sites are situated adjacent to the intersection of N14 Highway/R30 Road

Both 205 and 206 sites are **currently** zoned "*Farm*"

The proposed township shall comprise of:

- 2199 x Residential 1 Stand Houses
- 6 x Residential 2 Stand Houses
- 2 x Municipal/Institutional Stands
- 7 x Business stands
- 18 x Industrial 1/2
- 2 x Pre-schools
- 2 x Primary schools
- 1 x Secondary school
- 1 x Community health center
- 3 x Churches
- 1 x Public Garage
- 1 x Taxi Rank
- 6 x Public Spaces

1.2. Objectives of this Traffic Impact Assessment report

- To achieve the acceptable engineering practice standards and municipal standards and policies with reference to safety, security, convenience, efficiency, reliability, accessibility, practicality, economic, affordability, sustainability and environmentally friendly.
- To support sustainable development by protecting the overall integrity of the transportation system for the benefit of all users.
- To minimise all the impacts and at the same time have the greatest overall benefits.
- To develop and evaluate alternative options or solutions to determine the most preferred option.
- Determine the peak hour trips to be generated by the development and report on the impact thereof onto the existing road network.
- Analyze the access requirements for this site in specific and in relation to the adjacent properties.

2. Site Description and Characteristics

2.1. Locality

Site falls under 3 wards, namely: Ward 2, 4 and 6 in terms of spatial demarcation of JB Marks Local Municipality as approved by 2016 Municipal Demarcation Board.

The four-way crossing of N14 Highway/R30 Road is situated approximately at the centre of the site, which divides the site into four portions.

N14 and R30 bisect the site which then make all 4 portions to be adjacent to all these roads.

The site, Ptn 205 of Farm Elandskuil IP, is situated adjacent and to the:

- South-east of the intersection of N14/R30 Road which is under Ward 6, and
- South-west of the intersection of N14/R30 Road which is under Ward 4.

The site, Ptn 206 of Farm Elandskuil IP, is situated adjacent and to the:

- North-east of the intersection of N14/R30 Road which is under Ward 2,

See the locality figure on the next page.

2.2. Site area

- Re Extend of Ptn 206 measures 83.0076ha in extend and is held under Title Deed No: T14359/1986.
- Ptn 205 IP measures 174.4764 ha in extend and is held under Title Deed No: T98541/1997.
- Total area of the site area is 257.484 ha

Figure 1 : Locality Plan and Sub-development Portions



3. Methodology

The methodology in the report included:

- A site visit to observe current travel patterns, road geometry and to gain an understanding of the study area,
- For the purpose streamlining the contents of this report, the analysis shall of the site shall be separated into 4 developmental portions linked to the wards, being:
 - North-east portion on Ward 2 to be **Sub-Development A**
 - South-east portion on Ward 4 to be **Sub-Development B**
 - South-west portion on Ward 6 to be **Sub-Development C**
 - North-west portion on Ward 1 to be **Sub-Development D**

See Figure A – Locality plan for these sub-developments

- Trip generation, trip distribution and assignment,
- Traffic Counts,
- Capacity analysis,
- Sites access,
- Throat lengths,
- Conceptual layouts,
- All findings, recommendations and conclusion captured in the report.

Guidelines to be used:

- TMH 16 (Vol 1 & 2) – *South African Traffic Impact and Site Traffic Assessment Standards and requirements manual*
- TMH 17 – *South African Trip Data Manual*
- TRH 26 – *Road Classification and Access Management Manual*

4. Town Planning Matters:

Township establishment in terms of Township Ordinances 1986, Read in conjunction with SPLUMA 2013, Act no 16 of 2013

4.1. Existing Zoning and Land Use

- Zone : Farm

4.2. Proposed Development Controls

Table 1: Controls for Sub-Development A

Land Use	Sub-Development A		
	Parcels	Size	Total
Residential 1 Houses	686	Vary	686 units
Residential 2 Houses	3	1.15 + 1.01 + 4.71	6.87ha
Municipal	1	0.46 + 0.53	0.99ha
Business	2	1.25 + 1.71	2.96ha
Pre-school (1)	1	0.6ha	0.6ha
Primary school (1)	1	3.08ha	3.08ha
Public Spaces	4	Vary	-

Table 2: Controls for Sub-Development B

Land Use	Sub-Development B		
	Parcels	Size	Total
Residential 1 Houses	440	Vary	440 units
Industrial	7	Vary	7.64ha
Business	2	2.36ha + 0.15ha	2.51ha
Institutional / College	1	14.79ha	14.79ha
Municipal	1	1.14	2.28ha
Public Spaces	5	Vary	-

Table 3: Controls for Sub-Development C

Land Use	Sub-Development C		
	Parcels	Size	Total
Residential 1 Houses	1530	Vary	1530
Municipal	4	2.81 + 0.72 + 0.29	4.42ha
Business	3	3.87 + 0.47 + 1.1	5.44ha
Pre-school (1)	1	0.84ha	0.84ha
Primary school (1)	1	3.0ha	3.0ha
Secondary school (1)	1	5.12ha	5.12ha
Taxi Rank/Holding	1	0.6ha	0.6ha
Public Spaces	1	0.36ha	0.36ha

Table 4: Controls for Sub-Development D

Land Use	Sub-Development D		
	Parcels	Size	Total
Residential 2 Houses	1	6.74ha	6.74ha

See attached Annexure E for the Land use application and Annexure F for Proposed Conceptual Site Development Plan

The following controls of ratios and students are used for the development:

- Apartments and flats Density = 25 du/ha
- Business park FAR = 0.5
- Public Primary School no. of kids = 500
- Public Secondary School no. of kids= 500
- Pre-school no. of kids = 200
- Industrial FAR = 0.3
- Institutional/College no. student = 1000
- Medical Clinic FAR = 0.3
- Taxi rank/holding facility = 100 mini-bus

5. Accessibility to site and Road Classification

5.1. Road network master-planning

The road network adjacent to site are N14 and R30. R30 was previously owned by the provincial road authority but now is taken over by SANRAL.

There is no master plan for the area.

5.2. Road classification, design speed and design vehicle

5.2.1. Road Classification

For this report, road classification is very important for analysis of the traffic patterns within the vicinity of the site. The roads classification is according to COTO - RCAM

- a) N14 Highway currently is operating as – Class R2 (Rural major arterial) which will in future become Class R1 (Principal Arterial).
- b) R30 is in general classified as Class R2 (Rural minor arterial). R30 to the north of N14 links Ventersdorp and Rustenburg at approximately 95km, to the south of N14 links Ventersdorp and Klerksdorp at approximately 70km
 - It should be noted that R30 to the north from N14 goes into Ventersdorp Town and this 4.5km section of the road shall not have functions of a class 2 road, it shall operate Urban Class 3 and 4a.
 - R30 to the south shall be R2 however the first 2km section from the N14 shall be operating as Class U2

5.2.2. Design Speed

N14 = 120 km/h

R30 to the south = 80 km/hr first 5km section from N14

R30 to the south = 120 km/hr over 5km section from N14

R30 to the north = 70km/hr

5.2.3. Design vehicle

Sub-development	Normal operation	Occasional use
A	Bus	WB-15
B	WB-15	WB-20
C	Bus	WB-15
D	Bus	WB-15

6. Capacity Analysis

6.1. Trip generation, split and assignment

See trip reduction factors and trip generation rates attached as **Annexure B**.

6.1.1. Trip reduction factor, generation and split for Sub-Development A

Sub-development A - Calculation of trip reduction factor

$$P_c = 1 - (1 - P_M) \times (1 - P_V) \times (1 - P_T)$$

Land Use	Trips	% Mixed-Use (Max Factor)	% Low Vehicle	% Transit nodes	Combined factor without Mixed-use	Trips without Mixed-use factor (x)	In	Out	Assumption of Internal circulating trips for mix-use (y)	% of proposed Mixed use trips (y/x)	P _c Combined Factor
Residential 1 Houses	686	10	40	15	0,49	336	84	252	20	6	0,520
Residential 2 Houses	129	15	30	15	0,405	52	13	39	5	10	0,462
Business Park	222	15	20	15	0,32	71	60	11	10	14	0,416
Pre-school (1)	425	5	50	15	0,575	244	122	122	10	4	0,592
Primary school (1)	200	30	50	15	0,575	115	58	57	20	17	0,649

Trip Generation

Code	Land Use	Unit	Trip rate calc per	Trip Rate			Proposed	Trips			Trip Reduction factor	Trips with reduction factor		
				AM	Mid	PM		AM	Mid	PM		AM	Mid	PM
210	Single dwelling Units	No.	No.	1,00	-	1,00	686	686	-	686	0,520	329	-	329
232	Multi-level Town Houses	No.	No.	0,75	-	0,75	172	129	-	129	0,462	69	-	69
770	Business Park	sqm	100sqm	1,50	-	1,50	14800	222	-	222	0,416	130	-	130
520	Public Primary School	Student	Student	0,85	0,35	0,30	500	425	175	150	0,592	173	71	61
565	Pre-School	Student	Student	1,00	0,35	0,80	200	200	70	160	0,649	70	25	56

Trip Split

Land-use	Peak Period	Trips	PHF	Peak Hr pc trips	Split		
					Ratio	IN	OUT
Single dwelling units	AM	329	-	329	25:75	82	247
	PM	329	-	329	70:30	230	99
Multi-level Town	AM	129	-	129	25:75	32	97
	PM	129	-	129	70:30	90	39
Business Centre Park	AM	130	-	130	85:15	111	20
	PM	130	-	130	20:80	26	104
Public Primary School	AM	173	0,55	315	50:50	158	157
	Midday	71	0,55	129	45:55	58	71
	PM	61	0,55	111	50:50	55	55
Pre-school	AM	70	0,85	82	50:50	41	41
	Midday	25	0,85	29	50:50	15	15
	PM	56	0,85	66	50:50	33	33

6.1.2. Trip reduction factor, generation and split for Sub-Development B

Sub-development B - Calculation of trip reduction factors

$$P_c = 1 - (1 - P_M) \times (1 - P_V) \times (1 - P_T)$$

Land Use	Trips	% Mixed-Use (Max Factor)	% Low Vehicle	% Transit nodes	Combined factor without Mixed-use	Trips without Mixed-use factor (x)	In	Out	Assumption of Internal circulating trips for mix-use (y)	% of proposed Mixed use trips (y/x)	P _c Combined Factor
Single dwelling Units	440	10	40	15	0,490	216	54	162	20	9	0,537
Industrial Area (Park)	183	5	30	15	0,405	74	19	56	4	5	0,437
Business Park	288	15	20	15	0,320	92	78	14	10	11	0,394
Institutional - College	200	20	50	15	0,575	115	58	57	8	7	0,605

Trip Generation

Code	Land Use	Unit	Trip rate calc per	Trip Rate			Proposed	Trips			Trip Reduction factor	Trips with reduction factor		
				AM	Mid	PM		AM	Mid	PM		AM	Mid	PM
210	Single dwelling Units	No.	No.	1	-	1	440	440	-	440	0,537	204	-	204
130	Industrial Area (Park)	sqm	100sqm	0,8	-	0,8	22900	183	-	183	0,437	103	-	103
770	Business Park	sqm	100sqm	1,5	-	1,5	12550	188	-	188	0,394	114	-	114
520	Institutional - College	Student	Student	0,2	0,25	0,2	1000	200	250	200	0,605	79	99	79

Trip Split

Land-use	Peak Period	Trips	PHF	Peak Hr pc trips	Split		
					Ratio	IN	OUT
Single dwelling units	AM	204	-	204	25:75	51	153
	PM	204	-	204	70:30	143	61
Industrial Area (Park)	AM	103	-	103	75:25	77	26
	PM	103	-	103	30:70	31	72
Business Centre Park	AM	114	-	114	85:15	97	17
	PM	114	-	114	20:80	23	91
Institution - College	AM	79	0,55	144	50:50	72	72
	Midday	99	0,55	180	50:50	90	90
	PM	79	0,55	144	50:50	72	72

6.1.3. Trip reduction factor, generation and split for Sub-Development C

Sub-development C - Calculation of trip reduction factors

$$P_c = 1 - (1 - P_M) \times (1 - P_V) \times (1 - P_T)$$

Land Use	Trips	% Mixed-Use (Max Factor)	% Low Vehicle	% Transit nodes	Combined factor without Mixed-use	Trips without Mixed-use factor (x)	In	Out	Assumption of Internal circulating trips for mix-use (y)	% of proposed Mixed use trips (y/x)	P _c Combined Factor
Residential 1 Houses	1530	10	40	15	0,490	750	187	562	25	3	0,507
Business Park	408	15	20	15	0,320	131	111	20	10	8	0,372
Pre-school (1)	425	5	50	15	0,575	244	122	122	10	4	0,592
Primary school (1)	200	30	50	15	0,575	115	58	57	20	17	0,649

Trip Generation

Code	Land Use	Unit	Trip rate calc per	Trip Rate			Proposed	Trips			Trip Reduction factor	Trips with reduction factor		
				AM	Mid	PM		AM	Mid	PM		AM	Mid	PM
210	Single dwelling Units	No.	No.	1,00	-	1,00	1530	1530	-	1530	0,537	708	-	708
770	Business Park	sqm	100sqm	1,50	-	1,50	27200	408	-	408	0,372	256	-	256
520	Public Primary School	Student	Student	0,85	0,35	0,30	500	425	175	150	0,592	173	71	61
565	Pre-School	Student	Student	1,00	0,35	0,80	200	200	70	160	0,649	70	25	56

Sub-development C

Trip Split

Land-use	Peak Period	Trips	PHF	Peak Hr pc trips	Split		
					Ratio	IN	OUT
Single dwelling units	AM	708	-	708	25:75	177	531
	PM	708	-	708	70:30	496	212
Business Centre Park	AM	256	-	256	85:15	218	38
	PM	256	-	256	20:80	51	205
Public Primary School	AM	173	0,55	315	50:50	158	157
	Midday	71	0,55	129	45:55	58	71
	PM	61	0,55	111	50:50	56	55
Pre-school	AM	70	0,85	82	50:50	41	41
	Midday	25	0,85	29	50:50	15	14
	PM	56	0,85	66	50:50	33	33

6.1.4. Trip reduction factor, generation and split for Sub-Development D

Sub-development D - Calculation of trip reduction factors

$$P_c = 1 - (1 - P_M) \times (1 - P_V) \times (1 - P_T)$$

Land Use	Trips	% Mixed-Use (Max Factor)	% Low Vehicle	% Transit nodes	Combined factor without Mixed-use	Trips without Mixed-use factor (x)	In	Out	Assumption of Internal circulating trips for mix-use (y)	% of proposed Mixed use trips (y/x)	P _c Combined Factor
Residential 2 Houses	129	15	30	15	0,405	52	13	39	0	0	0,405

Trip Generation

Code	Land Use	Unit	Trip rate calc per	Trip Rate			Proposed	Trips			Trip Reduction factor	Trips with reduction factor		
				AM	Mid	PM		AM	Mid	PM		AM	Mid	PM
232	Multi-level Town Houses	No.	No.	0,75	-	0,75	169	127	-	127	0,405	75	-	75

Trip Split

Land-use	Peak Period	Trips	PHF	Peak Hr pc trips	Split		
					Ratio	IN	OUT
Multi-level Town	AM	75	-	75	25:75	19	56
	PM	75	-	75	70:30	53	23

6.2. Capacity analysis standards

- Assessment hours: Normal Hours.
- Right turn movements at signalized intersections may operate at LOS E on condition that queue length of 95th percentile is provided.
- Acceptable LOS is D.
- Microscopic simulation software used: Auto J (Developed by Dr. John Sampson).

Level of Service Criteria (HCM)

Level of Service	Avg. Delay for Stop Controlled
A	<10
B	<15
C	<25
D	<35
E	<50
F	= 50+

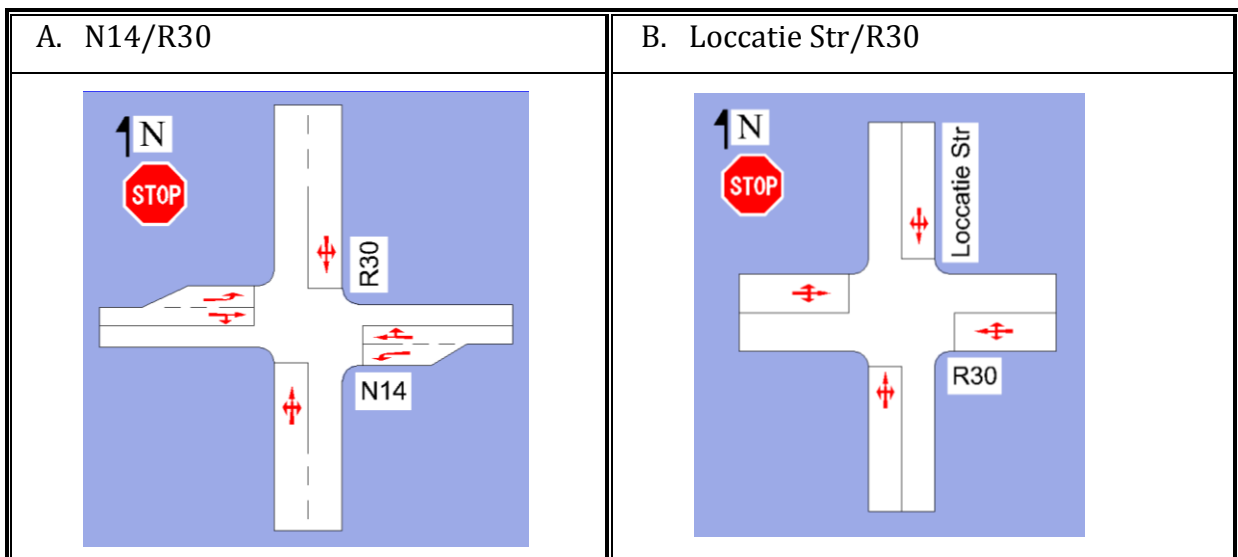
6.3. Data collection

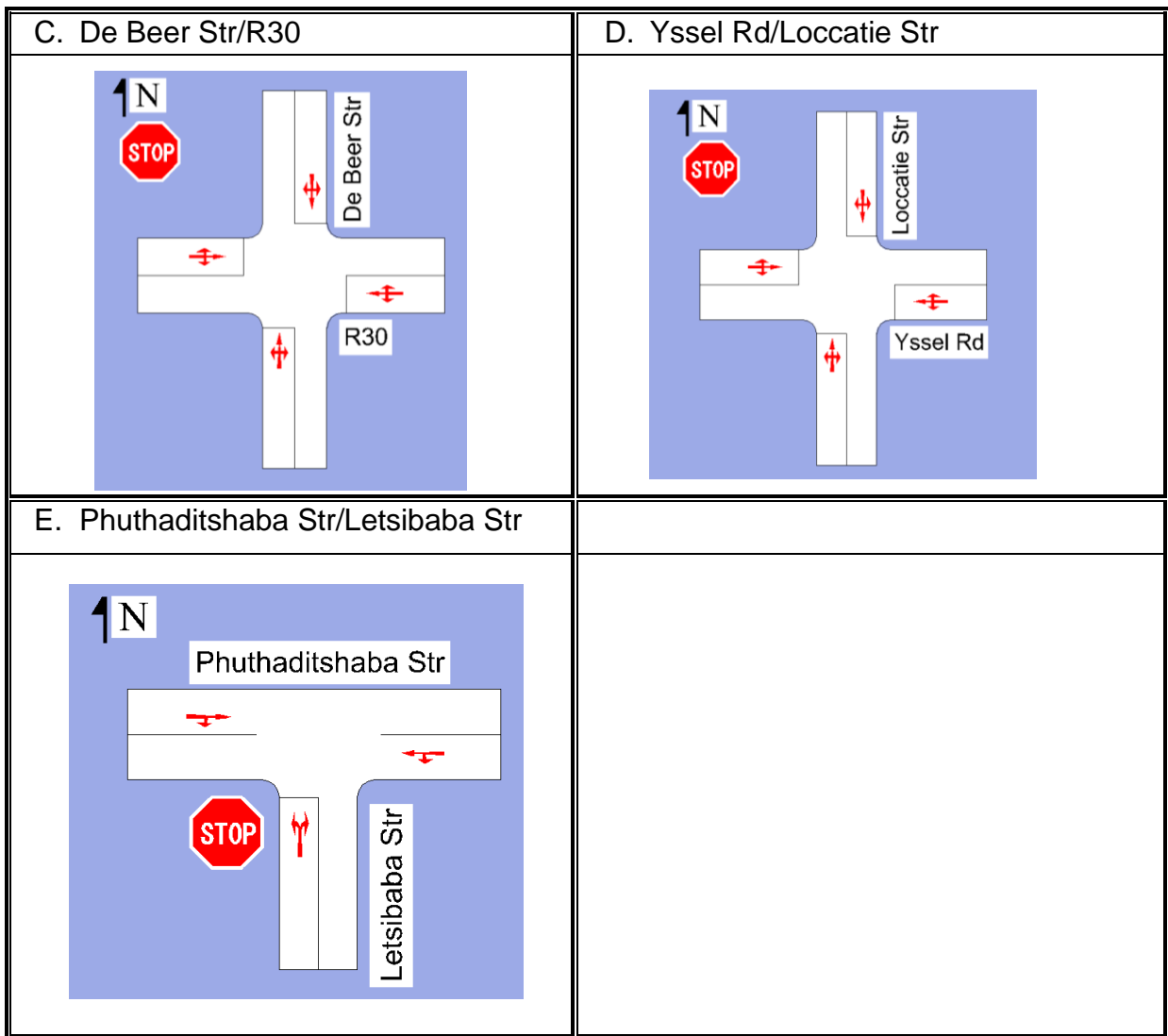
6.3.1. Traffic counts:

Manual intersection traffic counts were conducted.

- Date : 15 November 2017 (Wednesday)
- Period : Morning - 6:00 – 9:00,
Afternoon - 15:00 – 18:00
- Intersections : A. N14/R30
B. Loccatie Str/R30
C. De Beer Str/R30
D. Yssel Rd/Loccatie Str
E. Phuthaditshaba Str/Letsibaba Str
- Lane configurations of the intersections is reflected by the layouts on the table of summary of intersection analysis results below.

Table 5: Intersections lane configurations





6.3.2. Peak Hour & Years of analysis

- AM : 6H45 - 7H45
- PM : 16H30 - 17H30
- Base year : 2018
- Horizon year : 2023

6.4. PHF, growth rate and trip distribution

6.4.1. Peak hour factor

HCM recommends 0.92 PHF for urban areas, it will therefore be applied to calculate the peak hour volumes.

6.4.2. **Growth rate**

- The COTO recommends 3-4% growth rates for average growth areas.
- The surrounding area is developed with residential units and commercial.
- A growth rate of 4.0% shall be applied for analysis.

See attached Annexure C for Traffic Counts, Peak hour and projections.

6.4.3. **Trip distribution**

See the attached Figure 3 of Annexure A.

6.5. **Assessment Scenarios and criteria**

Table 6: Assessment Scenarios

SCENARIO	ASSESSMENT YEAR AND TRAFFIC DEMAND	INTERSECTION LAYOUT
1	Status Quo 2018	Existing 2018 road layout.
2	2017 Background + Development	Improved 2018 road layout.
3	2023 Horizon	Improved 2018 road layout.
4	2023 Horizon + Development	Improved 2018 Layout

6.6. **Intersections capacity analysis results for scenarios**

See detailed intersection analysis results attached as **Annexure D**.

Table 7: Intersection A- Summary of analysis results

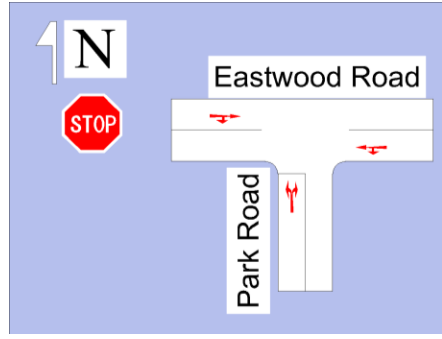
Scenario 1	Intersection Layout	AM Peak			PM Peak			
		v/c	Delay	LOS	v/c	Delay	LOS	
		North	0.2	9	A	0.1	9	A
		South	-	-	-	-	-	-
		West	0.3	1	A	0.1	0	A
		East	0.1	0	A	0.3	2	A
		Overall	0.2	2	A	0.3	2	A
		Intersection operates at highly acceptable level of service.						
Scenario 2	Intersection Layout	AM Peak			PM Peak			
		v/c	Delay	LOS	v/c	Delay	LOS	
		North	0.19	9	A	0.1	9	A
		South	-	-	-	-	-	-
		West	0.26	1	A	0.1	0	A
		East	0.12	1	A	0.3	2	A
		Overall	0.23	2	A	0.3	2	A
		Intersection will still operate at highly acceptable level of service with the development trips during base year.						
Scenario 3	Intersection Layout	AM Peak			PM Peak			
		v/c	Delay	LOS	v/c	Delay	LOS	
		North	0.25	10	B	0.1	9	A
		South	-	-	-	-	-	-
		West	0.3	2	A	0.1	0	A
		East	0.14	1	A	0.4	2	A
		Overall	0.26	3	A	0.3	2	A
		Intersection will still operate at highly acceptable level of service during the horizon year.						
Scenario 4	Intersection Layout	AM Peak			Friday PM Peak			
		v/c	Delay	LOS	v/c	Delay	LOS	
		North	0.3	10	B	0.1	9	A
		South	-	-	-	-	-	-
		West	0.3	2	A	0.1	0	A
		East	0.2	1	A	0.4	2	A
		Overall	0.3	3	A	0.3	2	A
		Intersection will operate at highly acceptable LOS during the horizon year with the site traffic.						

Table 8: Intersection C - Summary of analysis results

Scenario 1: 2017 Existing	AM Peak			PM Peak			
	v/c	Delay	LOS	v/c	Delay	LOS	
	North	-	-	-	-	-	
	South	0,11	9	A	0,05	9	A
	West	0,29	2	A	0,11	0	A
	East	0,08	0	0	0,32	2	0
	Overall	0,23	2	A	0,27	2	A
	The 2017 background traffic operates at highly acceptable LOS.						
Scenario 2: 2017 + Dev	AM Peak			PM Peak			
	v/c	Delay	LOS	v/c	Delay	LOS	
	North	-	-	-	-	-	
	South	0,12	9	A	0,06	9	A
	West	0,31	2	A	0,12	1	A
	East	0,08	0	0	0,34	2	0
	Overall	0,24	2	A	0,29	2	A
	The road network operating conditions will still be at highly acceptable LOS with the development trips.						
Scenario 3: 2022 Horizon	AM Peak			PM Peak			
	v/c	Delay	LOS	v/c	Delay	LOS	
	North	-	-	-	-	-	
	South	0,15	9	A	0,08	9	A
	West	0,35	2	A	0,13	1	A
	East	0,09	0	0	0,38	2	0
	Overall	0,28	2	A	0,32	2	A
	The road network operations will still be at highly acceptable LOS during the horizon year.						
Scenario 4: 2022 + Dev	AM Peak			PM Peak			
	v/c	Delay	LOS	v/c	Delay	LOS	
	North	-	-	-	-	-	
	South	0,16	9	A	0,09	9	A
	West	0,36	2	A	0,14	1	A
	East	0,10	0	0	0,40	3	0
	Overall	0,29	3	A	0,34	2	A
	Development trips will have negligible effect on the highly acceptable operating conditions in the horizon year.						

Table 9: Intersection D - Summary of analysis results

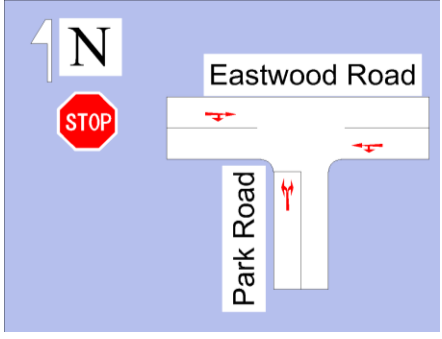
Scenario 1: 2017 Existing



	AM Peak			PM Peak		
	v/c	Delay	LOS	v/c	Delay	LOS
North	-	-	-	-	-	-
South	0,04	8	A	0,02	8	A
West	0,28	2	A	0,11	0	A
East	0,08	0	0	0,26	1	0
Overall	0,23	2	A	0,22	1	A

The 2017 background traffic operates at highly acceptable LOS.

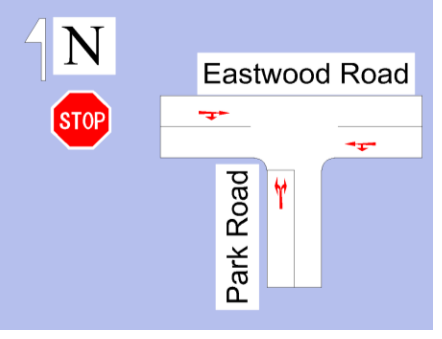
Scenario 2: 2017 + Dev



	AM Peak			PM Peak		
	v/c	Delay	LOS	v/c	Delay	LOS
North	-	-	-	-	-	-
South	0,04	9	A	0,02	8	A
West	0,30	2	A	0,11	1	A
East	0,09	0	0	0,28	2	0
Overall	0,24	2	A	0,23	1	A

The road network operating conditions will still be at highly acceptable LOS with the development trips.

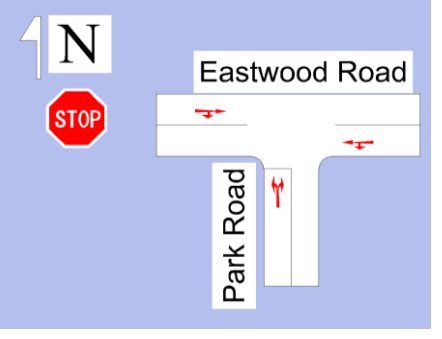
Scenario 3: 2022 Horizon



	AM Peak			PM Peak		
	v/c	Delay	LOS	v/c	Delay	LOS
North	-	-	-	-	-	-
South	0,05	9	A	0,02	8	A
West	0,34	2	A	0,13	1	A
East	0,10	0	0	0,31	2	0
Overall	0,27	2	A	0,26	2	A

The road network operations will still be at highly acceptable LOS during the horizon year.

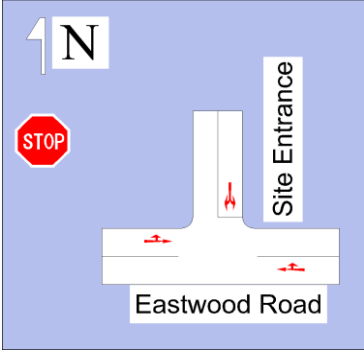
Scenario 4: 2022 + Dev




	AM Peak			PM Peak		
	v/c	Delay	LOS	v/c	Delay	LOS
North	-	-	-	-	-	-
South	0,06	9	A	0,03	8	A
West	0,35	2	A	0,14	1	A
East	0,10	0	0	0,33	2	0
Overall	0,28	2	A	0,27	2	A

Development trips will have negligible effect on the highly acceptable operating conditions in the horizon year.

Table 10: Intersection Entrance - Summary of analysis results

Scenario 2a: 2017 + Dev (Alt 1)		AM Peak			PM Peak		
		v/c	Delay	LOS	v/c	Delay	LOS
	North	0,03	9	A	0,13	9	A
	South	-	-	-	-	-	-
	West	0,30	2	A	0,09	0	A
	East	0,11	1	0	0,34	2	0
	Overall	0,25	2	0	0,27	2	0
	<p>With the proposed stop from the site merging to Eastwood Street, the site access will not have any capacity problem during the base year.</p>						

Scenario 4a: 2022 + Dev (Alt 1)		AM Peak			PM Peak		
		v/c	Delay	LOS	v/c	Delay	LOS
	North	0,04	9	A	0,16	9	A
	South	-	-	-	-	-	-
	West	0,35	2	A	0,11	0	A
	East	0,13	1	A	0,40	3	A
	Overall	0,30	2	A	0,33	3	A
	<p>The site access will still not have capacity problems in the horizon year.</p>						

7. Road Access, Intersection Provision and Spacing

- Full intersection shall be provided for all sub-developments with R30 being a priority road.
- There is an access position approved at approximately 600m to the north of N14 along R30 which is meant to provide an access to Tshing Village and proposed sub-development D. A symmetrical intersection is therefore proposed to provide an access to the proposed sub-development A. Also a second linkage on the northern part of the sub-development A is proposed. This second linkage shall link with the intersection to Tshing Village.
- A symmetrical intersection to sub-developments B and C is proposed to the south of N14 along R30. Since this intersection is new, it will require a spacing of $800 \pm 15\%$ along R30 from N14 intersection.
- Internal Class 4a, 4b and 5b intersections to be spaced at a minimum of 100m, 75m and 50m respectively.

8. Access analysis

8.1. Driveway design

Not required during the Traffic Impact Assessment Stage.

8.2. Accesses throat lengths

Not required during the Traffic Impact Assessment Stage.

9. Sight distance requirements

Sight distance calculations:

Sub-development A – Access Y

Movement	No. of lanes
Left turn	1
Straight through	3

- Left turn movement
- Straight through movement

9.1. Access position

9.1.1. Proposed site access position

- Sub-development A: 2 intersections are proposed off R30 to provide access. The intersections are denoted as Y and Z on figure 2 below.
- Sub-development B and C: intersection is proposed off R30 to provided access to these two sub-developments. The intersection is denoted as X on figure 2 below.
- Sub-development D: This development shall obtain access of an existing Letsibaba Street.

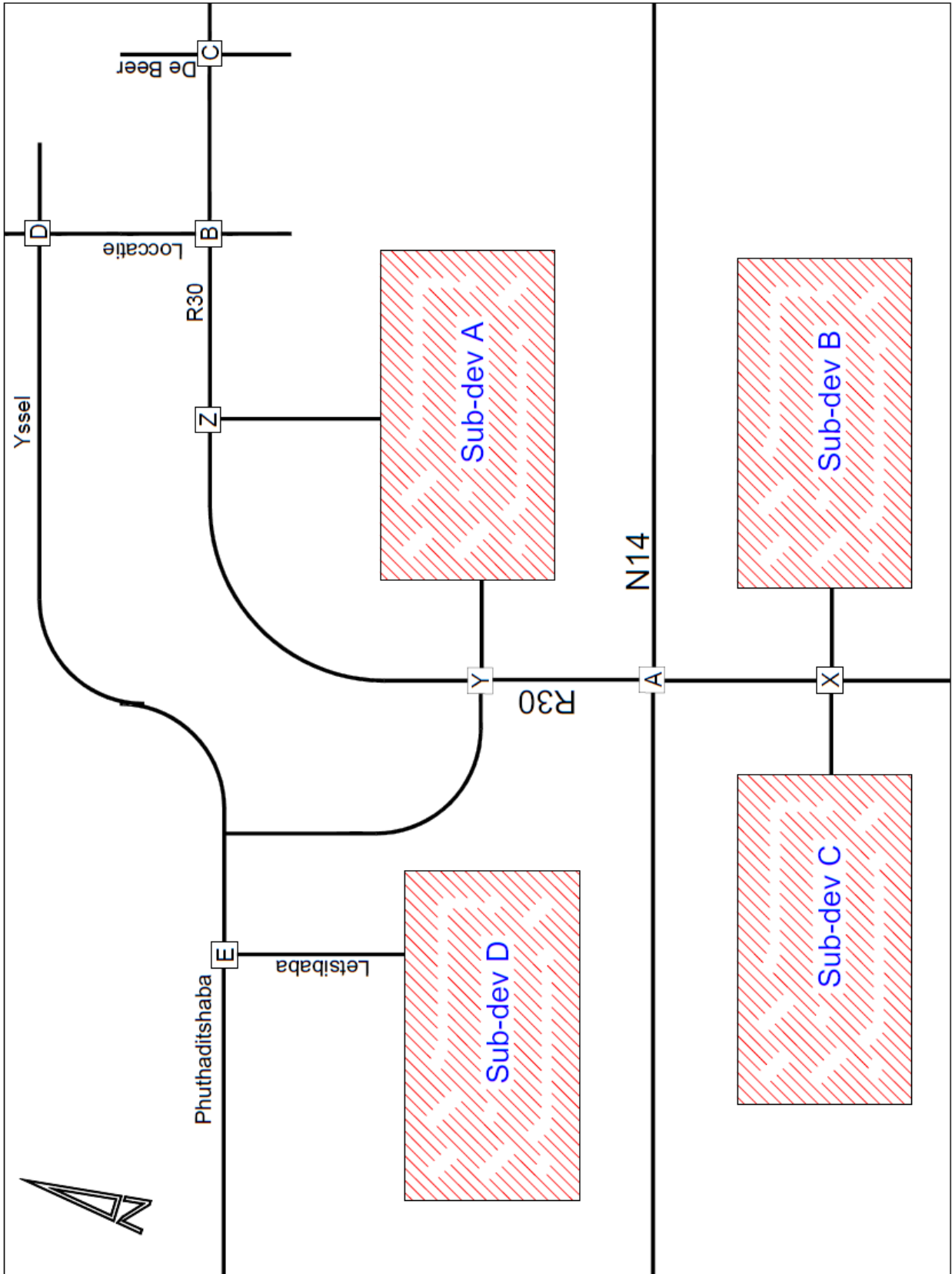
9.1.2. Impact of site access on adjacent properties

- All the sites access does not affect the neighbourhood accesses.

9.2. Recommended access layout and control from the road

From above summary of intersection analysis results, it is recommended that all-way stop control be provided to better the operating conditions for the site access.

Figure 2 : Existing Intersections and Proposed access positions



10. Road Widening, PWV Network and Servitudes

10.1. Road widening & PWV Network

- a. Municipal Roads: No widening required.
- b. Provincial Roads: Site is not affected.
- c. SANRAL Roads: Site is not affected.

See Annexure F for PWV Road Network.

10.2. Servitudes

- Internal road servitudes in accordance of the road classes shall be registered to the satisfaction of the municipality.
- External and internal splays to be registered to the satisfaction of SANRAL and Municipality respectively.
- Servitudes for road connection network to the neighbouring properties shall be registered to the satisfaction of the Municipality.

11. Public transport assessment

In terms of the National Land Transport Act (NLTA) (Act No 5 of 2009) Section 35, assessment of public transport should be included in the traffic impact assessments. The following comments are relevant in respect to the public transport availability at the proposed development.

a. Public transport

- R30 Road is a transit road comprising of mini-buses (taxis) and buses.
- It is proposed that the one stand zoned Municipal in Sub-development C shall be allocated to taxis as a small taxi holding and rank. This taxi rank shall have dedicated route within Sub-developments B and C.
- The site shall therefore be well serviced by Public Transport.

b. Non-motorized transport

- A 1,5m paved side-walk is therefore proposed to be constructed on the internal roads in accordance with the Municipal standards at the properties frontage to cater for NMT.

12. Parking requirements

- There is a conceptual Site Development Plan prepared which is not yet finalized, however, the parking shall be provided internally as per the town-planning scheme.

13. Summary and Recommendations

⇒ *In summary:*

- This TIA report is prepared to support a Township establishment in Ventersdorp area, situated at the intersection of N14/R30.
- The methodology of approaching this development TIA was sub-dividing development into four sub-developments i.e A, B, C and D situated at NE, SE, SW and SE of N14/R30 intersection respectively.
- Land use township application is in circulation seeking an approval of the following rights on sub-developments:

Land Use	Measure	Sub-development			
		A	B	C	D
Residential 1 Houses	No. Units	686	440	1530	-
Residential 2 Houses	ha	6.87	-	-	6.74
Industrial	ha	-	7.64	-	-
Municipal	ha	0.99	2.28	5.02	-
Business	ha	2.96	2.51	5.44	-
Pre-school	ha	0.6	-	0.84	-
Primary school	ha	3.08	-	3.0	-
Secondary school	ha	-	-	5.12	-
Institutional (College)	ha	-	14.79	-	-
Public Spaces	ha	Vary	Vary	Vary	-

Land Use	Measure for Trips	Sub-development			
		A	B	C	D
Residential 1 Houses	No. Units	686	440	1530	-
Residential 2 Houses	No. of Units	172	-	-	169
Industrial	FA (m ²)	-	22900	-	-
Municipal	To be determined	-	-	-	-
Business	FA (m ²)	14800	12550	27200	-
Pre-school	No. Students	200	-	200	-
Primary school	No. Students	500	-	500	-
Secondary school	No. Students	-	-	500	-
Institutional (College)	No. Students	-	1000	-	-
Public Spaces	N/A	-	-	-	-

Peak Hour Trips

Land Use	Sub-dev A			Sub-dev B			Sub-dev C			Sub-dev D		
	AM	Midday	PM	AM	Midday	PM	AM	Midday	PM	AM	Midday	PM
Residential 1	329	-	329	204	-	204	708	-	708	-	-	-
Residential 2	69	-	69	-	-	-	-	-	-	75	-	75
Industrial	-	-	-	103	-	103	-	-	-			

Municipal	-	-	-	-	-	-	-	-	-	-	-	-
Business	130	-	130	114	-	114	256	-	256	-	-	-
Pre-school	70	25	56	-	-	-	70	25	56	-	-	-
Primary school	173	71	61	-	-	-	173	71	61	-	-	-
Secondary school	-	-	-	-	-	-	-	-	-	-	-	-
College	-	-	-	79	99	79	-	-	-	-	-	-
Public Spaces	-	-	-	-	-	-	-	-	-	-	-	-

- Traffic counts were conducted at the following intersections:
 - N14/R30
 - R30/Yssel Str
 - R30/De Beer Str
 - Locattie Str/Yssel Str
 - Phuthaditshaba Str/Letsibaba
- AM and PM peak hours were determined to be 6:45 – 7:45 and 16:30 – 17:30 respectively.
- PHF of 0.92 and 4% traffic growth rate were applied for analysis of intersections.
- Auto J micro-analysis program was used to analyze the intersections.
- Intersection analysis results:

Intersection	Description	2018	2018+Dev	2023	2023+Dev
A	N14/R30	Operates at acceptable LOS	Operates at acceptable LOS	Operates at acceptable LOS	Operates at acceptable LOS
B	R30/Locattie Str	Operates at acceptable LOS	Operates at acceptable LOS	Operates at acceptable LOS	Operates at acceptable LOS
C	R30/De Beer Str	Operates at acceptable LOS	Operates at acceptable LOS	Operates at acceptable LOS	Operates at acceptable LOS
D	Locattie/Yssel	Operates at acceptable LOS	Operates at acceptable LOS	Operates at acceptable LOS	Operates at acceptable LOS
E	Phuthaditshaba /Letsibaba	Operates at acceptable LOS	Operates at acceptable LOS	Operates at acceptable LOS	Operates at acceptable LOS
X	Sub-dev B & C/R30	Operates at acceptable LOS	Operates at acceptable LOS	Operates at acceptable LOS	Operates at acceptable LOS
Y	Sub-dev A/R30	Operates at acceptable LOS	Operates at acceptable LOS	Operates at acceptable LOS	Operates at acceptable LOS
Z	Sub-dev A/R30	Operates at acceptable LOS	Operates at acceptable LOS	Operates at acceptable LOS	Operates at acceptable LOS

- Public transport is available along R30 Road which is adjacent to the sub-developments. A taxi holding and rank shall also be provided at one stand zoned Municipal.
- Servitudes to be provided to the satisfaction of the Municipality.
- Splays to be provided to the satisfaction of SANRAL and Municipality.

⇒ *It is therefore recommended that:*

a. Upgrades by the developer

i. Site access

- Sub-development A to obtain 2 intersections off R30 that will provide access to site. First to be situated at approximately 600m to the north of the intersection of R30/N14, the second access to be at approximately 700m from the first intersection. Access to be as per the SANRAL specification.
- Sub-development B and C to obtain one intersection off R30 that will provide access to both developments. The access to be situated at approximately 800m to the south of the intersection of R30/N14. Access to be as per SANRAL specification.
- Sub-development D to obtain access off Letsibaba street.

ii. Non-motorised transport

- A 1,5m paved side-walk to be constructed within the internal property roads on the properties frontage to cater for NMT.

14. **Conclusion**

Based on the contents and findings contained in this report, it is recommended that the authority approves the recommendations in this report, pertaining to the Development.

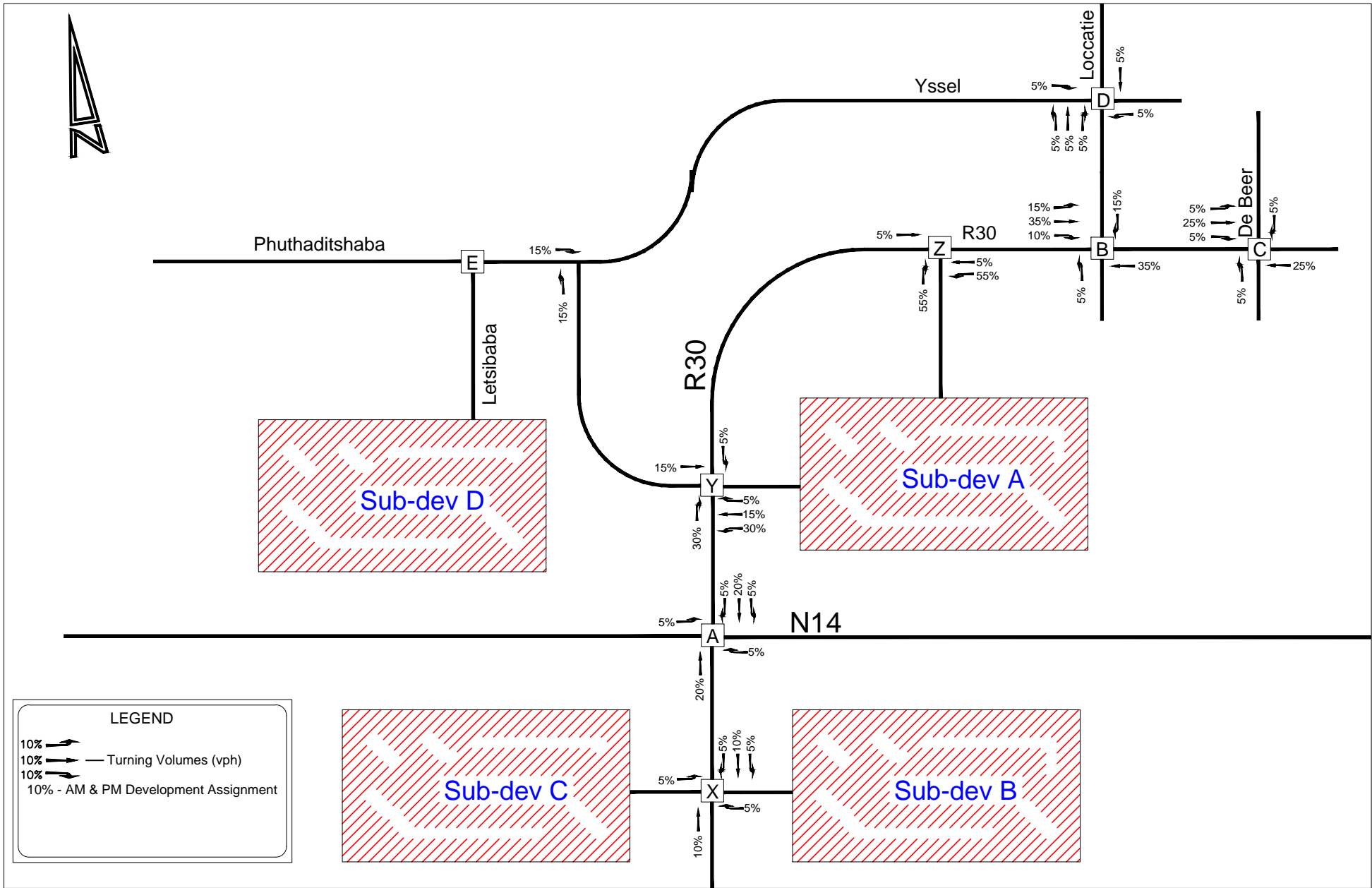
Should there be any further information required, please feel free to contact us as soon as possible.

15. **References:**

- *Principles of Highway Engineering and Traffic Analysis by FL Mannering, WP Kilareski and SS Washburn*
- *Guidelines for Human Settlement Planning and Design by CSIR*
- *Guidelines for access to private developments by JC de Vries*
- *South African Trip Data Manual - TMH 17, Version 1.01, September 2013 by Committee of Transport Officials (COTO)*
- *South African Traffic Impact and Site Traffic Assessment Standards and Requirements Manual, August 2012, by COTO*
- *Technical Guidelines and Criteria for Enclosed Neighbourhoods, June 2007*
- *National Land Transport Act – Act No 5 of 2009 Section 35*

Annexure A

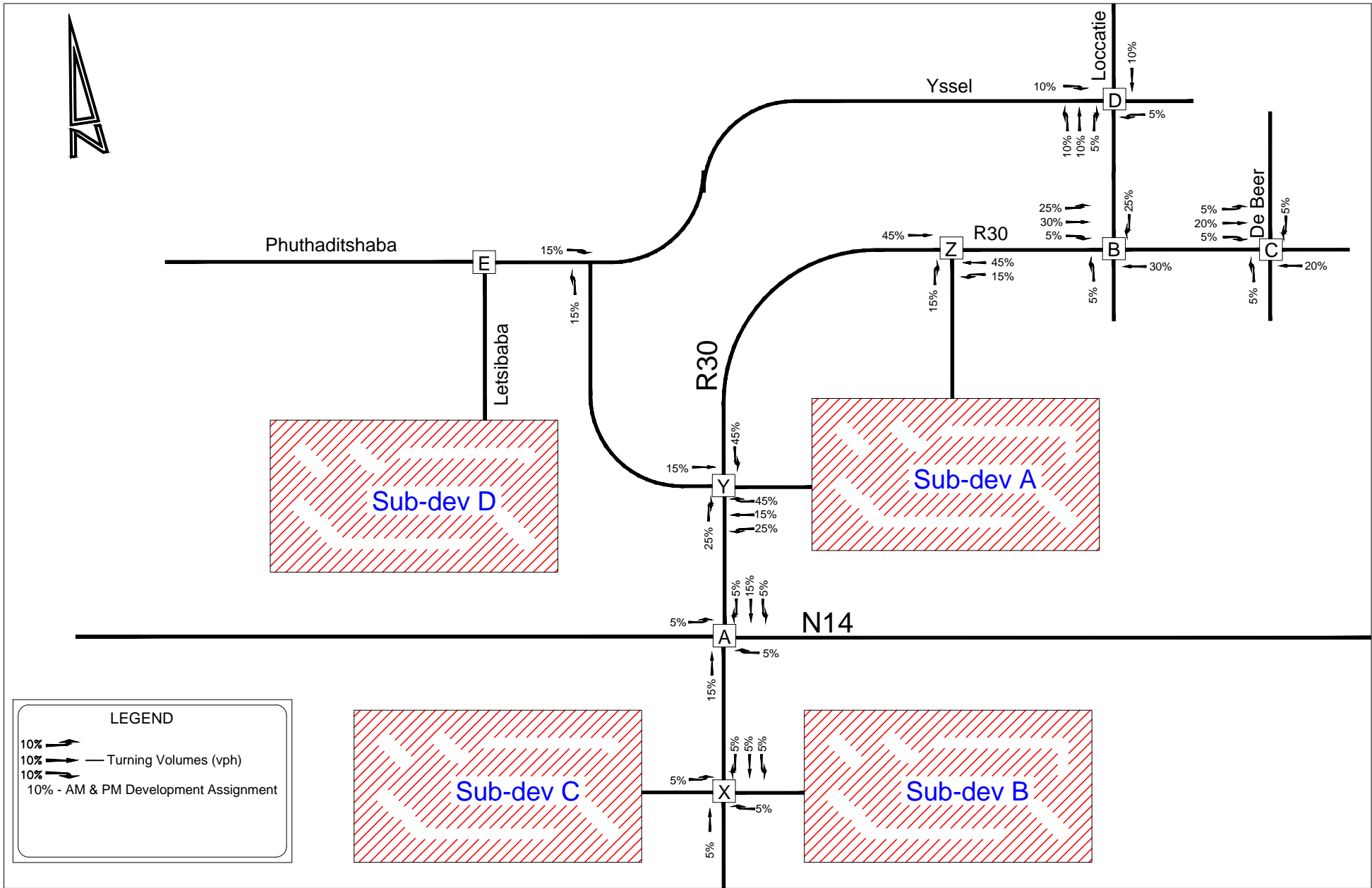
**-List of Figures
(Volumes)**



Sub-Development A - Residential Trip Assignment

N14 Development (Ventersdorp)

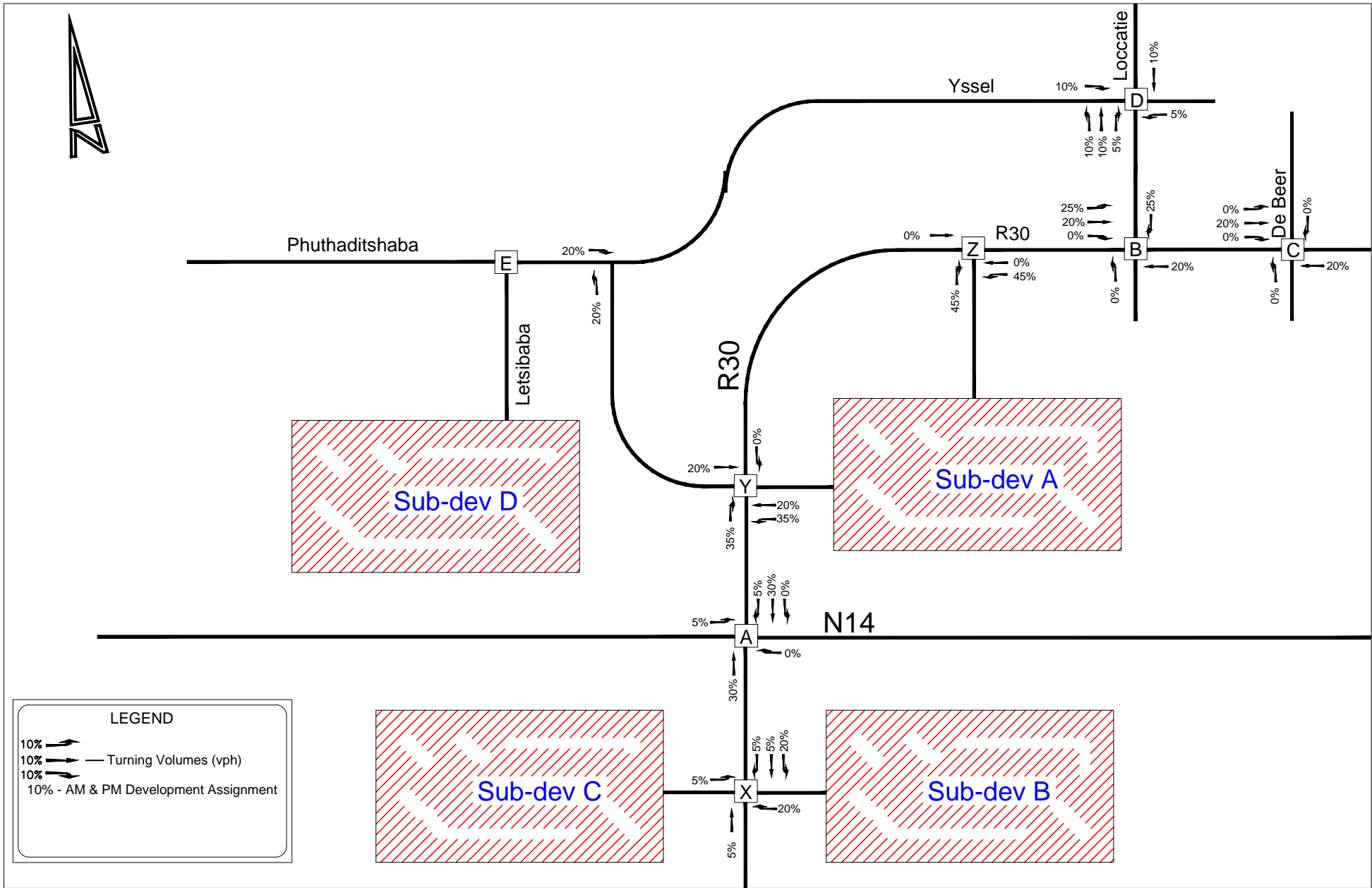
Figure 3A1



Sub-Development A - Business Trip Assignment

N14 Development (Ventersdorp)

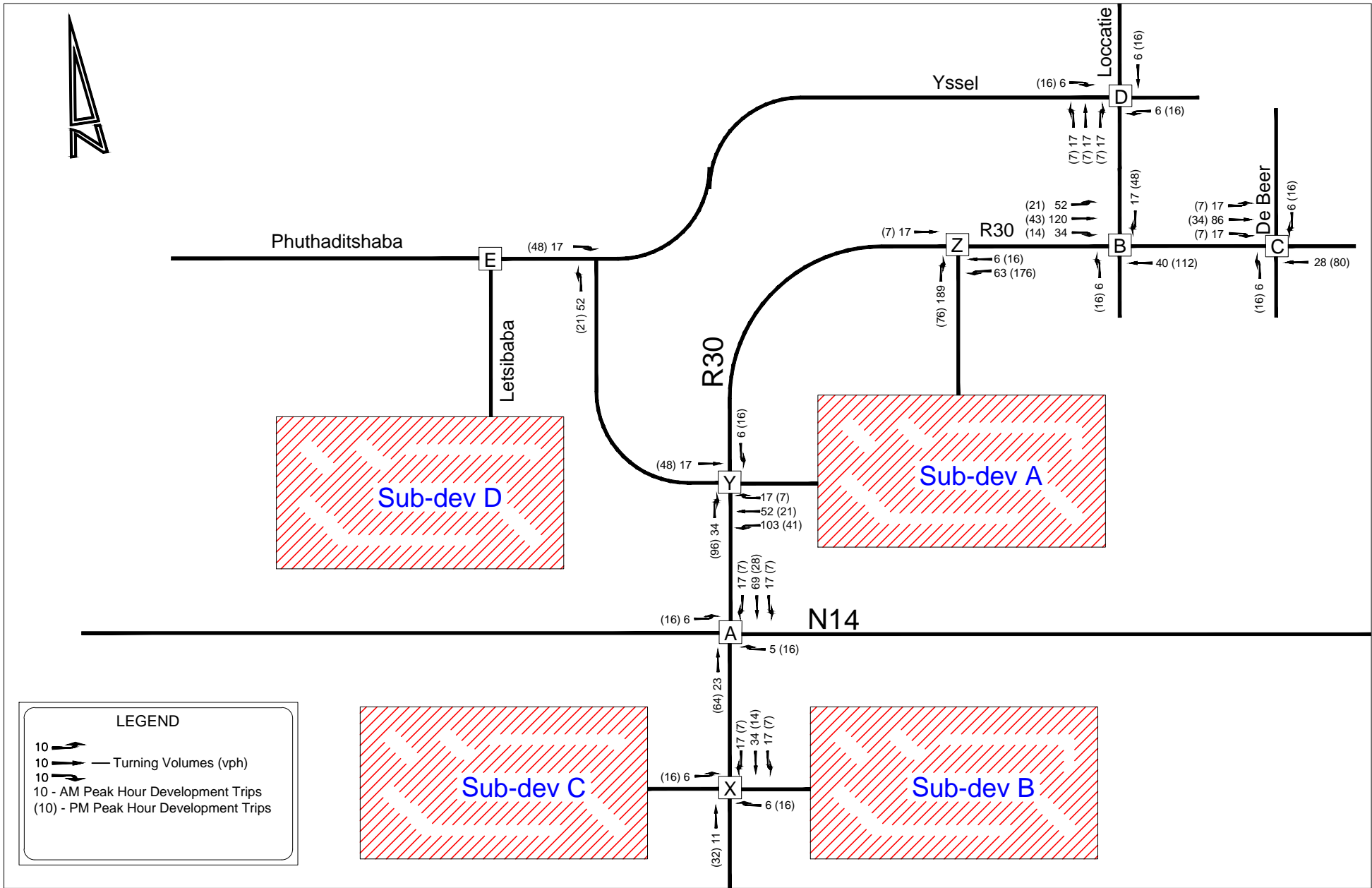
Figure 3A2



Sub-Development A - Schools Trip Assignment

N14 Development (Ventersdorp)

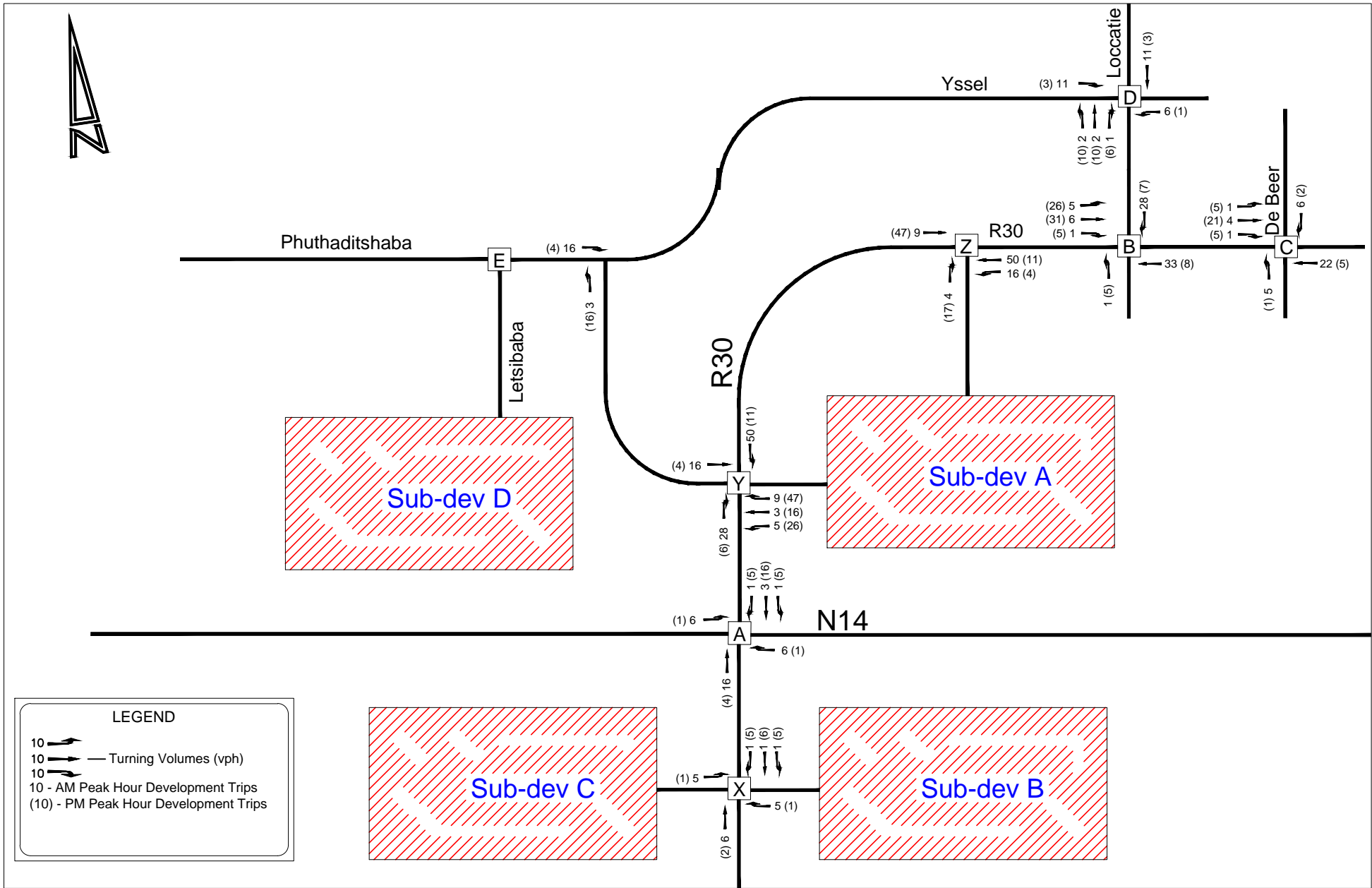
Figure 3A3



Sub-Development A - Residential Trips

N14 Development (Ventersdorp)

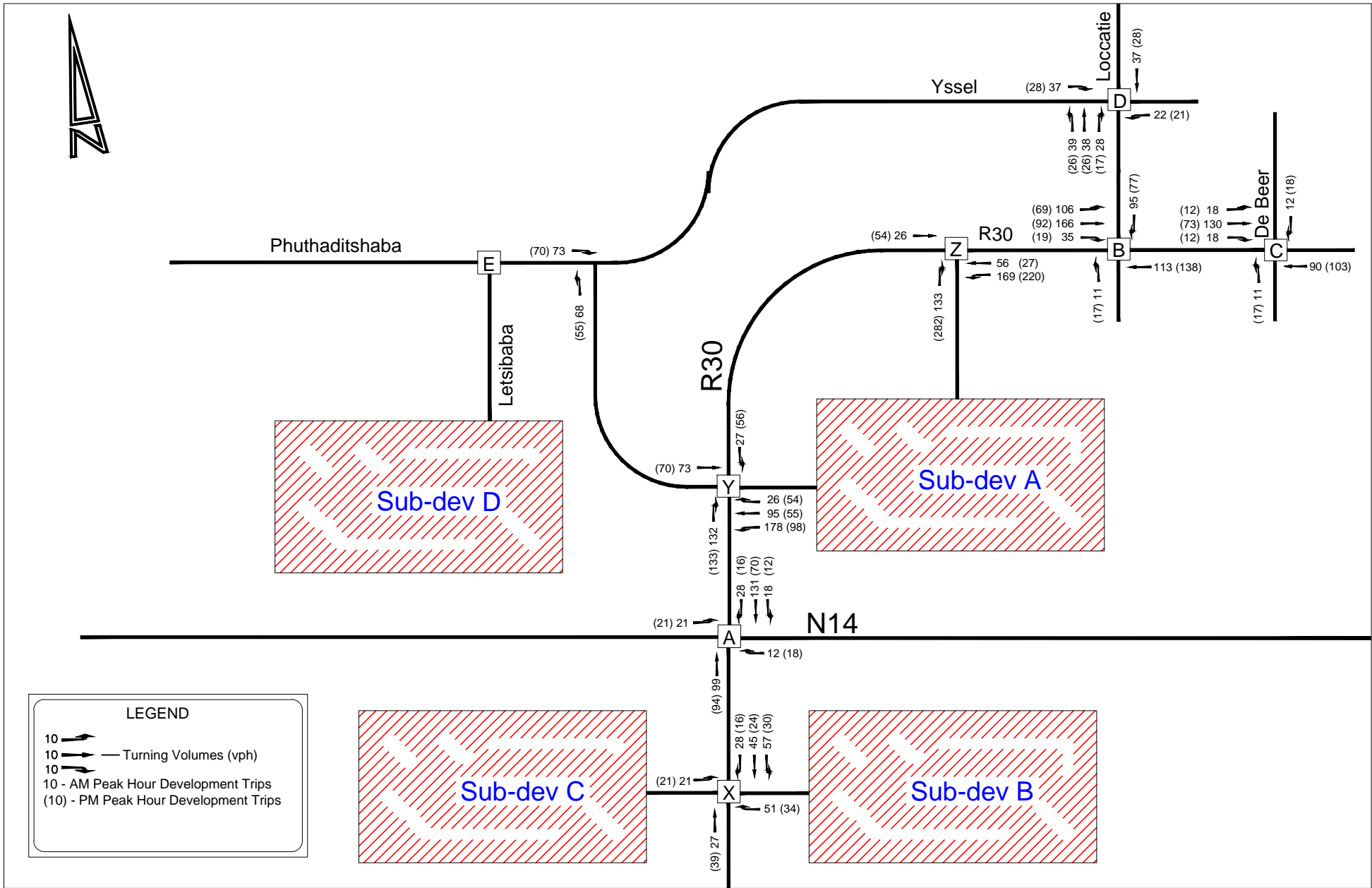
Figure 4A1



Sub-Development A - Business Trips

N14 Development (Ventersdorp)

Figure 4A2



Sub-Development A - Overall Trips

N14 Development (Ventersdorp)

Figure 4AO

Annexure B

- Trip Generation Rates

Table 3.2: Trip Generation Adjustment Factors

Land Use	Size Units	Percentage reduction for developments in areas with				
		Mixed-use Development	Low vehicle Ownership	Very Low Ownership	Transit nodes or Corridors	
100 Industrial						
110	Service Industry	100 sqm GLA	5%	20%	30%	15%
120	Heavy industry/manufacturing	100 sqm GLA	5%	20%	30%	15%
121	Mining	1 Employees	5%	20%	30%	15%
130	Industrial Area (Park)	100 sqm GLA	5%	20%	30%	15%
140	Manufacturing	100 sqm GLA	5%	20%	30%	15%
150	Warehousing and Distribution	100 sqm GLA	5%	20%	30%	15%
151	Mini-Warehousing	100 sqm GLA	5%	20%	30%	15%
200 Residential						
210	Single Dwelling Units	1 D/Unit	10%	40%	70%	15%
220	Apartments and Flats	1 D/Unit	15%	30%	50%	15%
225	Student Apartments and Flats	1 D/Unit	25%	50%	80%	15%
231	Townhouses (Simplexes and Duplexes)	1 D/Unit	15%	30%	50%	15%
232	Multi-Level Townhouses	1 D/Unit	15%	30%	50%	15%
251	Retirement Village	1 D/Unit	5%	50%	80%	15%
254	Old-Age Home	1 D/Unit	5%	50%	80%	15%
260	Recreational Homes	1 D/Unit	10%	20%	30%	15%
300 Lodging						
310	Hotel, Residential	1 Room	20%	20%	30%	15%
330	Hotel, Resort	1 Room	20%	20%	30%	15%
350	Guest House	1 Room	20%	30%	50%	15%
400 Recreational and Sport						
430	Golf Course	1 Course	5%	0%	0%	0%
473	Casino	100 sqm GLA	5%	20%	30%	15%
480	Amusement Park	1 ha	5%	30%	50%	15%
488	Sport Stadium	1000 Seat	5%	30%	50%	15%
492	Health and Fitness Centre	100 sqm GLA	15%	20%	30%	15%
500 Institutional						
520	Public Primary School	1 Student	30%	50%	80%	15%
530	Public Secondary School	1 Student	30%	50%	80%	15%
536	Private School	1 Student	30%	50%	80%	15%
550	University / College	1 Student	20%	40%	60%	15%
560	Places of Public Worship (Weekend)	1 Seat	10%	50%	80%	15%
561	Places of Public Worship (Weekday)	1 Seat	10%	50%	80%	15%
565	Pre-School (Day Care Centre)	1 Student	5%	50%	80%	15%
566	Cemetery	1 Ha	0%	30%	50%	15%
600 Medical						
611	Public Hospital	1 Bed	0%	50%	80%	15%
612	Private Hospital	100 sqm GLA	0%	20%	30%	15%
620	Nursing Home	1 Bed	0%	50%	80%	15%
630	Medical Clinic	100 sqm GLA	0%	50%	80%	15%
700 Office						
710	Offices	100 sqm GLA	20%	20%	30%	15%
713	Home offices and undertakings	1 House	10%	20%	30%	15%
720	Medical consulting rooms	100 sqm GLA	10%	30%	50%	15%
770	Business Centre (Park)	100 sqm GLA	15%	20%	30%	15%
780	Conference Centre	1 Seat	10%	20%	30%	10%

800 Retail

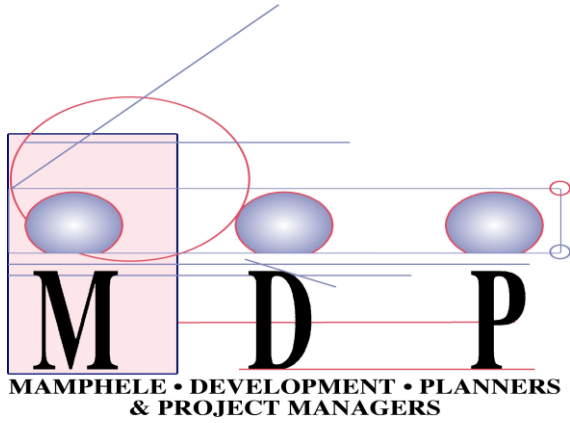
812	Building Materials	100 sqm GLA	10%	30%	50%	15%
816	Hardware and Paint Store	100 sqm GLA	10%	30%	50%	15%
817	Nursery (Garden Centre)	101 sqm GLA	10%	30%	50%	15%
820	Shopping Centre	100 sqm GLA	10%	30%	60%	15%
830	Bulk Trade Centre	100 sqm GLA	10%	30%	60%	15%
841	Motor Dealership	100 sqm GLA	5%	20%	30%	15%
860	Wholesale Market (Fresh produce)	100 sqm GLA	0%	0%	0%	5%
890	Furniture Store	100 sqm GLA	5%	30%	50%	15%

900 Services

931	Restaurant, Quality (Sit-down)	100 sqm GLA	10%	10%	15%	15%
932	Restaurant, Family (Sit-down)	100 sqm GLA	10%	30%	50%	15%
933	Fast Food	100 sqm GLA	10%	40%	60%	15%
946	Filling Station	1 Station	0%	0%	0%	0%
950	Vehicle Fitment Centre	100 sqm GLA	0%	0%	0%	0%

Annexure E

**- Land Use
Application**



**INCEPTION AND DATA COLLECTION REPORT: PROPOSED
N14 TOWNSHIP ESTABLISHMENT(RFP/NW/2017/007).**

DATE: 10 NOVEMBER 2017

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1. INTRODUCTION

The Housing Development Agency("HDA") has, on 27 September 2017 appointed Mamphela Development Planners CC ("MDP") to carry out a detailed Township establishment for the creation of an Integrated and Sustainable Human Settlement on the farms: Elandskuil No. 205 IP and Elandskuil No. 206, IP, North-West Province within the JB Marks Local Municipality in Ventersdorp.

This report serves as the Inception Plan according to which the contract is to be implemented. The report is structured in line with the stated project activities and deliverables as set out in the Terms of Reference and it is not necessary in our view to repeat them in this paragraph, save to indicate that the sequence of this Inception Report is a product of the project proposal as submitted to the HDA by MDP.

This appointment has been followed by a Service Level Agreement duly signed on 04 October 2017 by the parties to this agreement.

1.1. National Objectives of Sustainable Human Settlement Developments.

The National goals of Sustainable Human Settlements are generally covered by the Breaking New Ground Policy call on Human Settlements Developers to:

- Accelerate delivery of housing within the context of sustainable human settlements;
- Provide Integrated housing within human settlements' inclusionary approach;
- Provide quality housing to turn homes into assets;
- Create a single, efficient formal housing market;
- Abolish apartheid spatial planning thereby, restructuring and integrating human Settlements; and
- Incorporating environmental protection as part of the integrated Human Settlement development;

2. STUDY AREA IN CONTEXT

The urban area within the Local Municipality, collectively known as Ventersdorp, comprises the suburbs Ventersdorp, Tshing and Toevlug. There are six rural villages located within Ventersdorp Local Municipality, as set out below:

- ❖ Goedgevonden
Situated 23km north east of Ventersdorp, within ward 5
- ❖ Welgevonden
Situated 17km north-north east of Ventersdorp, within ward 3
- ❖ Tsêtsê
Situated 15km north of Ventersdorp, within ward 3
- ❖ Ga-Mogopa
Situated 23km north-north east of Ventersdorp, within ward 3
- ❖ Boikhutso
Situated 10km north of Ventersdorp, within ward 3
- ❖ Boikhutsong
Situated 17km north east of Ventersdorp, within ward 5

The municipality is home to almost 48,981 people of which 60% is urbanized (Ventersdorp) and 40% rural. Approximately 94% of Ventersdorp Local Municipality is classified as agricultural land (cultivated and uncultivated) which reflects the rural nature and character of Ventersdorp Local Municipality

3. LOCALITY

Ventersdorp Local Municipality is situated in the eastern part of the North West Province. It is one of the four local municipalities in Dr Kenneth Kaunda District Municipality. Situated towards the north of Dr Kenneth Kaunda District Municipality, Ventersdorp borders onto Gauteng Province towards the east, Bojanala District Municipality towards the north and Ngaka Modiri Molema District Municipality towards the west.

The respective farm portions are briefly described below:

- **Remaining Extent of the farm Elandskuil 206 IP**

This portion measures 83,0076 Hectares and is held under Title Deed No: T14359/1986.

This portion is also located on the south-western outskirts of Ventersdorp, north east of the N14 and R30 intersection.

The portion remains mostly unoccupied with the exception of the north eastern edge which is occupied by informal dwellers

and the north western edge which is occupied by a quarry.

- **Unregistered Portion 3 of the farm Elandskuil 205 IP**

- This portion measures 143,7769 Hectares and is held under Title Deed No: T98541/1997.

The total area of both portions of land is **257.484 hectares.**











Figure 1: Locality of Land Portions

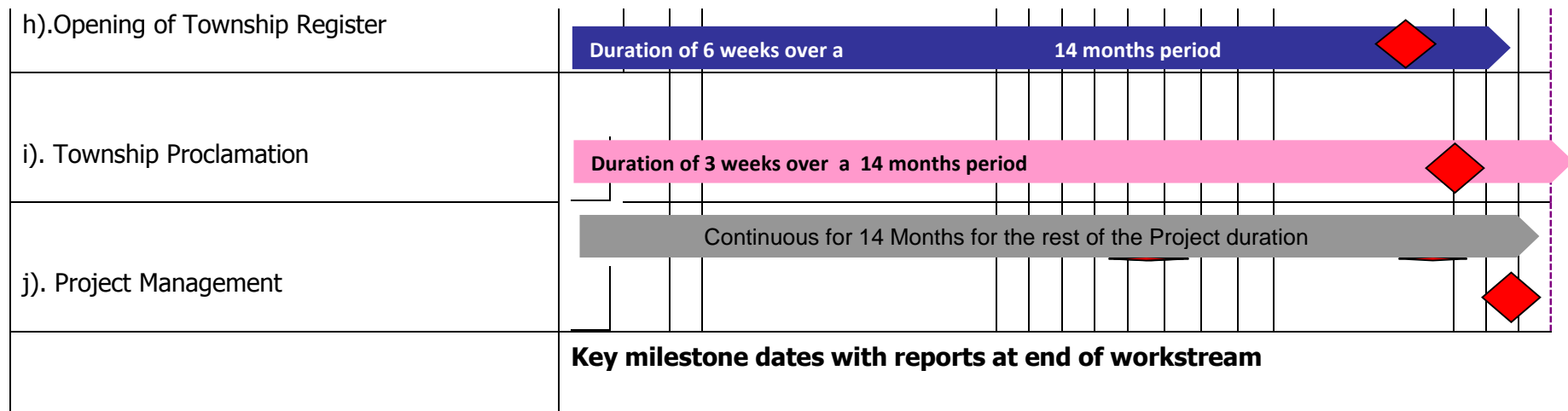
4. PROPOSED IMPLEMENTATION PROGRAMME

In order for the project to be implemented within reasonable time frames, the following Implementation Programme is proposed for adoption by the Client.

It needs to be noted though while we will take every reasonable effort to ensure that the Project is delivered within the stipulated timeframe, a greater proportion of the implementation time will be taken by the respective approving authorities which too often do not consider these kinds of applications within the statutory time frames. Our role in this regard will be a continuous persuasion of these approving authorities for speedy approvals.

Road Project Timeline for the proposed Re/Elandskuil 205 and 206-IP Township Establishment:

Activities	Month 1-4	Month 5-8	Month 9-12	Month 13-14
Inception (stage 0)	 <p>Duration of 2 weeks over a 14 months period</p>			
a).Topographical Survey	 <p>Duration of 4 Weeks over a 14 Months period</p>			
b). Environmental Impact Assessment Report & RoD	 <p>Duration of 6 Months over a 14 Months period</p>			
c). Civil Engineering Services Reports & Floodline	 <p>Duration of 3 months over a 14 months period</p>			
d). Geotechnical Report	 <p>Duration of 7 Weeks over a 14 Months period</p>			
e). Township Establishment application & circulation	 <p>Duration of 4 months over a 14 months period</p>			
f). Township approval process	 <p>Duration of 4 Months over a 14 Months period</p>			
g). GP Generation, pegging & approval	 <p>Duration of 5months over a 14 months period</p>			



4.1. Detailed Programme with actual timelines.

Proposed Township Establishment: Remainder of Elandskuil 206 & Ptn 3/205, IP JB Marks Municipality, North-West Province.

No	Items/Activities	TIME FRAME(MONTHS): BASE MONTH: OCTOBER 2017													
		OCT-2017	NOV	DEC	JAN-,18	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV
A: INCEPTION REPORT		02-Oct to 13-Oct/17													
1	. Estimated Timeframes,														
2	Initial Stakeholder engagement;														
3	Site visits;														
4	Final determination of the study area and														
5	Signing of the Service Level Agreement														

6	B: TOWN PLANNING																		
7	1.Stakeholder Management																		
8	1.1. Client liaison/Mun/Community																		
9	1.2. attend Project meetings																		
10	1.3. Prepare &submit progress reports																		
11	2. Data collection	02-Oct to 13-Oct/17																	
12	2.1. Gather cadastral information																		
13	2.2.Obtain title deed and verify any restrictive conditions																		
14	2.3.Obtain Land Claims information(if any)																		
15	2.4.Obtain SDF & IDP Information in relation to the subject property																		
16	2.5. Site visits																		
17	3. Prepare detailed Layout Plan																		
18	3.1.Design layout plan																		
19	3.2.Digitise layout plan on GIS & Autocad																		
20	4.Prepare Detailed Township Application																		
21	4.1.Prepare Motivation Memo																		
22	4.2.Prepare Conditions of Establishment																		
23	4.3.Prepare Advert Notices																		
24	4.4. Lodge & circulate application																		
25	4.5.Respond to comments																		

26	4.6.follow-up on application															
27	4.7.Facilitate approval of appl.															
28	4.8.Final Cond of establishment															
29	4.9. Township Approval															
C: LAND SURVEYING																
27	C: LAND SURVEYING															
28	1.1. Base Mapping and Contour Survey generation	09-Oct to 18/Oct/17														
29	1.2. Generation of the SG Diagram & digitisation															
30	1.3. Pegging of the township Layout after approval of SG Diagram															
31	1.4. Approval of the SG Diagram & SG Examination Fees															
D: ENGINEERING SERVICES																
32	D: ENGINEERING SERVICES															
33	1.1. Determine Flood line Frequency on 1:100 year															
34	1.2. Prepare and submit Outline Scheme Reports(all eng. services)															
35	1.3. Prepare detailed costing for Engineering Services															
E: ENVIRONMENTAL IMPACT ASSESSMENT																
36	E: ENVIRONMENTAL IMPACT ASSESSMENT															
37	1.1. Data collection & Field Survey: Scoping Phase															
38	1.2. Registration & verification of I & Aps															
39	1.3. Draft Report writing															
40	1.4. Public Participatiuon process															
41	1.5. Submission of final Scoping Report to DEDECT															

42	1.6. Approval of Scoping Report by DEDECT															
43	1.7. Preparation and submission of Final EIR report															
44	1.8. Approval of EIR (RoD obtained from DEDECT)															
45	1.9. Conduct all Specialist Studies required															
46	F: CONVEYANCING & LEGAL															
47	1.1. Prepare a Conveyancer's Certificate & Title Conditions															
48	1.2. Verify Conditions of Establishment for legality															
49	1.3. Prepare Section 53 Documents for Deeds Office															
50	G: TRAFFIC IMPACT STUDY															
51	1.1.Existing traffic flows and patterns															
52	1.2. Background Traffic Flows															
53	1.3. Trip Generation Analysis															
54	1.4. Trip distribution analysis															
55	1.5. Report writing & presentation															
56	H: GEOTECHNICAL INVESTIGATION (IN LINE WITH NDPG GUIDELINES)															
57	1.1.Conduct desktop studies															
58	1.2. TLB hire and test pitting															
59	1.3. GFSH-2, Phase 1 Fieldwork and excavation of test pits															
60	1.4. Data analysis, cartography and interpretation															

61	1.5. Laboratory testing of soil conditions														
62	1.6. Reporting and recommendations														
63	I: TOWNSHIP PROCLAMATION														
64	1.1. Opening of Township Register														
65	1.2. Township Proclamation														

5. DATA SO FAR COLLECTED

5.1. TOWN PLANNING INFORMATION

The Township Establishment process will start with data collection. The following information has so far been collected:

- Cadastral information on the subject property
- Obtained title deeds and will later assess any restrictive conditions (if any) for the subject property;

Obtain strategic planning and related documents. These documents have so far been obtained from the Municipality:

- ✚ The Ventersdorp Municipal Integrated Development Plan (IDP) 2016-2017
- ✚ Spatial Development Framework (SDF) 2010
- ✚ Draft Local Economic Development (LED) Strategy 2015
- ✚ Draft Housing Sector Plan (HSP) 2014
- ✚ Dr Kenneth Kaunda District Municipality IDP and sector plans
- ✚ National Spatial Development Plan (NSDP)
- ✚ Provincial Growth and Development Strategy (PGDS)

These documents are currently being reviewed and analyzed in order to establish the development vision and planning principles for the Study Area.

The review and analysis of the documents will also assist with both vertical and horizontal alignment.

5.1.1. INFORMATION GAPS

It is important to indicate that, Ventersdorp Local Municipality was disestablished and merged with Tlokwe City Council Local Municipality to establish

JB Marks Local Municipality on 3 August 2016. Most of the information available is historical in nature and relates to the municipality before being disestablished.

As a result of the disestablishment, a number of key strategic documents are in a draft form and have not yet been approved by council as official documents.

Other documents are outdated and need to be reviewed as per the applicable legislation.

The following information gaps were identified during this initial data collection stage:

1. Socio Economic study/ Market assessment will be required as it will inform the housing product type, affordability and percentage allocations.
2. The municipality has the waiting list which is not used as it is considered unsatisfactory as a result, the extend of housing demand/ backlog cannot be established.
3. The alternative to establishing demand is use the Provincial Demand Data Base which must be informed by the municipal waiting lists
4. The Informal Settlements Upgrading Programme (ISUP) report was compiled in 2008, this report provides an overview of informal settlements identified within Ventersdorp. Informal settlements have direct bearing on the provision of housing
5. SDF was last approved in 2010, and should have been reviewed after five years as required by the Municipal Systems Act (No. 32 of 2000) as it forms a significant part of key strategic documents for the municipality
6. Housing Sector Plan 2014 is still in a draft format, therefore, there appears to be no approved Housing Sector Plan in place;
7. The LED Strategy is also still in a draft form.

5.2. SITE VISIT WITH MUNICIPAL OFFICIALS

A preliminary meeting with both Municipal and HDA officials took place in Potchefstroom on the 10th October 2017 in order to introduce our Team to the municipality. After the meeting a site visit and walk about with the entire project team and municipal officials followed on Monday, the 16th October 2017 in Ventersdorp.

5.3. ENVIRONMENTAL INFORMATION

The focus of attention for this part of the project will be on the following, namely:

- undertake the flora & fauna assessments,
- undertake the Wetland/ riparian delineation & functional assessment merged with the Soils & Agricultural Potential, so as to provide high level input into the Wetland Sensitivity and Extent w.r.t the project site, with the aim to determine no-go areas and sensitive landscape elements, and
- undertake a heritage impact assessment,

- lastly, expedite the socio-economic survey, in order to develop the following: Socio-Economic Profile & the Socio-economic Needs Assessment

5.3.1. SITE VISIT OBSERVATIONS(ENVIRONMENTAL)

The following observations were made during our site visit as at week of 16 to 22 October 2017

It can be noted that we are aware that Venterdorp has been plagued with service delivery protests, included in there is a cry for housing provision by the community. In order to address the matter, note Council earmarked land parcels under its auspices for housing development. It is unfortunate, that council did not provide us with alternative farmland parcels that had lain as not ploughed for consideration. Nonetheless, from an ecological point of view, it can be noted that there are site sensitivities flagged hereunder with regards to the earmarked project sites and the Client is given a heads up that buffering will endeavour to bring resolve, that goes for heritage as well.

Key environmental features discerned on site:

- a watercourse that meanders gently through the middle wherein the two farms meet (see outline figures on the google image). Another gently winding channel can be seen east of the Remainder of the farm Elandskuil 206-IP. All sensitive sites will be rehabilitated and be zoned Public Open Space.
- there are graves close to the north-western boundary of the Remainder of the farm Elandskuil 205-IP. In terms of town planning they will not be disturbed as it has been planned that they be demarcated & zoned public open space for usage by family members of those buried (NB: - usage will be limited to allow visits to graves, paying homage & cleaning thereof). Whereas, to the north of the Remainder of the farm Elandskuil 206-IP, there is JB Marks Memorial site (consisting of his inscribed granite plate, grave & statue), after whom the new Vendersdorp municipality name has been officially changed. Thus as a further consideration from a Heritage point of view they will be buffered accordingly.
 - Tshing township lies immediately to the north of the development site.
 - Arterial routes depicted is the N14 to & from Krugersdorp & Lichtenburg bearing in an east west direction, whereas going from north to south (i.e. from small town Derby through Ventersdorp town to Klerksdorp is the Provincial road the R30).

- South, South East of RE/ 205 is Railway Line, Shell Garage & Transnet Freight Rail **Groynes**

5.4. TOPOGRAPHICAL SURVEY

A topographical survey on the subject property was conducted during October 2017 with the following geodetic Survey details:

- COORD-REF STATION: TRIG BCN
- BASE STATION 254
- XY SYSTEM: WG27
- Z DATUM: MSL
- CONTOUR INTERVAL :0,50m
- SCALE 1:1000

5.5. ENGINEERING SERVICES

ASSUMPTIONS

This report is prepared with the understanding that the information provided by the JB Marks Local Municipality's technical division is correct.

5.5.1. SCOPE

The scope of work for the bulk engineering services investigations conducted can be summarised as follows:

- Provide a topographical and geological overview of the study area;
- Investigate the study area(s) storm water drainage;
- Investigate the presence and current operational capacity of bulk engineering services infrastructure in terms of potable water supply, sanitation, electrical supply;
- Investigate road access to the study area;
- Investigate the presence of solid waste disposal facilities to service the proposed development;

- Conduct a study area slope analysis to determine which portion(s) of the study area are may be undevelopable;

5.5.2. TOPOGRAPHY AND DRAINAGE

The study area has an average height of 1465 meters above sea level and is dominated by gentle to fair slopes with average gradients of 1.3% on portion 205 IP and 5% on portion 206 IP draining south towards the Skoonspruit River. Due to the study area being dominated by gentle to fair gradients, storm water drainage problems and or any developmental constraints associated topographical gradients are not foreseen. However, storm water management measures should be incorporated into the study areas development to reduce and or eliminate any potential risks to life and property that may be posed by storm water runoff.

Storm water management objectives and mitigation measures highlighted below may be used as a guideline in the planning and design stages of proposed development(s) on the study area.

5.5.3. STORM WATER MANAGEMENT OBJECTIVES

Any proposed developments in the study area may have an impact on the natural storm water drainage patterns of the study area. Impacts of developments may include an increase in hardened areas, reduced infiltration areas, loss of vegetation and reduced evapo-transpiration potential. There may also be an overall increase in the speed of runoff and peak flow rates in the receiving streams and rivers in and around the study area.

It is thus important that storm water management system(s) form part of the study area's development planning process in order to reduce and manage impacts on the water cycle during and after development. Storm water management system(s) should be planned and designed in line with municipal storm water management policies and or engineering best practices. The study area's storm water management objectives should seek to address the following objectives:

- Control the quality and quantity of storm water runoff;
- To protect local and downstream water courses;
- Encourage natural ground water recharge;

- To prevent soil erosion;
- To protect all property and life from damage caused by storm water and flooding.

5.5.4. STORM WATER MANAGEMENT CONTROL MEASURES

The following design and construction measures should be adopted as control and mitigation strategies to address the above-mentioned objectives:

- Storm water runoff patterns should be assessed to determine peak flow rates and 1:100 flood line boundaries of water courses within close proximity of the study area. Outputs from such assessments will be used as input data required in the detailed design of culverts, channels and other storm water infrastructure;
- Storm water reticulation design and construction of storm water infrastructure should ensure that overall development of the study area does not increase the rate of storm water flow above that which the natural ground can safely accommodate at any point in the sub-catchments;
- Sub-surface disposal of storm water should be avoided;
- All natural and unlined channels should be inspected for adequate binding of soil to reduce erosion;
- Steeper watercourses (especially in portion 206 IP) should be protected from erosion through the use of appropriate channel linings or controlled drops to dissipate flow energy. Stone pitching should also be used to reinforce channel inverts on such slopes;
- Landscaping and or re-vegetation of areas not occupied by buildings or paving should be constructed immediately after building works have been completed, or have reached a stage where newly established ground cover to all sub-structures is not at risk from the construction works.

The above-mentioned control measures will go a long way in ensuring the environmental sustainability of the development whilst also protecting life and property from storm water damage.

5.5.5. GEOLOGICAL OVERVIEW

According to 1:25 000 geological maps supplied by the Council for Geoscience, the study area is dominantly underlain by amygdaloidal andesite igneous rock types of the Ventersdorp Super Group.

A near surface geotechnical investigation is currently being conducted on the study area by ZwaMavu Consultants to evaluate engineering characteristics of soils underlying the study area. A detailed geotechnical investigation report will be available after the investigation has been concluded.

5.6. BULK ENGINEERING SERVICES

5.6.1. Water Supply

The Ventersdorp town receives its potable water supply through river extraction of the Skoonspruit River via a network of canals. The water is then purified at the Ventersdorp Water Treatment plant and stored in reservoirs.

Potable water supply to the Ventersdorp town, the Tshing Township which is located north west of the study area and the Moosa Park suburb is via the town's bulk water reticulation network while the surrounding farms are supplied by the towns canal network and bore holes. Even though the study area currently does not have any water supply infrastructure constructed in it, bulk service connections to service the study area can be made in the adjacent Tshing Township.

Challenges associated with water supply within the JB Marks Local Municipality are aging infrastructure, water losses and lack of maintenance. The Department of Water and Sanitation in partnership with the then Ventersdorp Local Municipality have however recently completed an upgrade of the Ventersdorp bulk water supply system which included a new 5.7 Mega liter reservoir, an upgrade of the water treatment plant from 7 Mega liters a day to 14 Mega liters a day along with a 2.4-kilometer-long raising main from the water treatment plant to the reservoir. The upgrade has thus increased the town's reservoir storage capacity to 10.3 Mega liters and the water treatment plant's capacity to 14 Mega liters a day.

5.6.2. Sanitation

Sewerage disposal in the Ventersdorp town, Tshing Township and Moosa Park suburb is provided through a water borne sewerage reticulation network with the sewerage treated at the Ventersdorp Waste Water Treatment Works (WWTW). Sewerage disposal in the surrounding arms and informal settlements is provided through a combination of septic tanks and pit toilets.

The current sewerage volume in the system peaks at 2.7 Mega liters a day. The capacity of WWTW is 3 Mega liters a day. Even though the study area currently does not have any sewerage infrastructure constructed in it, bulk service connections to service the study area can be made in the adjacent Tshing Township.

Risks posed to the waterborne sewerage reticulation system in Ventersdorp are the aging infrastructure along with the lack of funding to adequately maintain and or upgrade the system.

5.6.3. Electrical Supply

Eskom is the sole bulk electricity supplier to the JB Marks Local Municipality. Residents in the Ventersdorp town receive power from the municipality while residents in the surrounding farms and villages are supplied by Eskom.

The current electrical supply to the municipality from Eskom is a total of 20MVA via a network of high voltage lines. The current municipal load on the grid is 9MVA leaving 11MVA available to service future developments and to connect villages not currently connected.

There are multiple overhead electrical power lines running through portion 205 IP and along the R30 thus electrical connections to any new developments in the study area may be made with relative ease.

Challenges facing the efficiency of the system include illegal connections, vandalism and aging infrastructure to list a few.



Figure 2: Overhead Power Lines at N14 - R30 Intersection

5.6.4. Road Infrastructure

The study area is easily accessible via the N14 which is the main route linking Ventersdorp with Colingy to the west and Krugersdorp to the east; and via R30 which is the main north-south route linking Ventersdorp and Klerksdorp. Both access roads are paved and seem to be well maintained.

Typical traffic on both access roads includes small vehicles for personal use, busses and trucks transporting agricultural products between towns.

A traffic impact study is currently being conducted by MDP to assess traffic impact the proposed development will have on the existing infrastructure and propose suitable access points from the N14 and R30 respectively. A detailed traffic impact study report will be available once the study has been concluded.



Figure 3: Road Access Along R30

5.6.5. Waste Disposal

The JB Marks Local Municipality provides waste collection services to the Ventersdorp town, Tshing Township and Moosa Suburb serviced currently by one landfill site. Waste collection services do not extend to residents the surrounding farms, villages and informal settlements. Some residents in these un-serviced areas currently dispose of their waste in unoccupied parcels of land which may pose health hazards.

The close proximity of the study area to the Tshing Township will thus enable waste collection services to easily be extended to service the proposed development.

5.6.6. OVERALL STATUS QUO ASSESSMENT

The availability of key bulk service infrastructure (bulk water, sanitation, electricity and waste disposal) within the vicinity of the study area and the lack of any visible geological features that may negatively affect the overall development render the study area feasible for development.

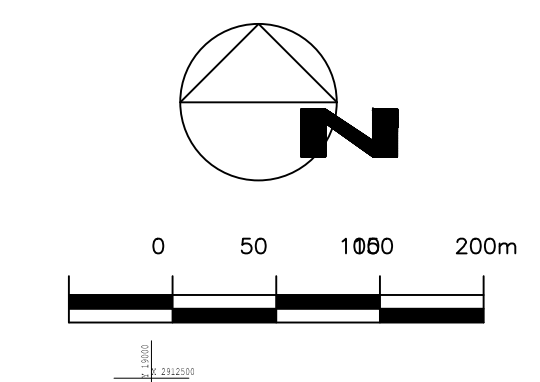
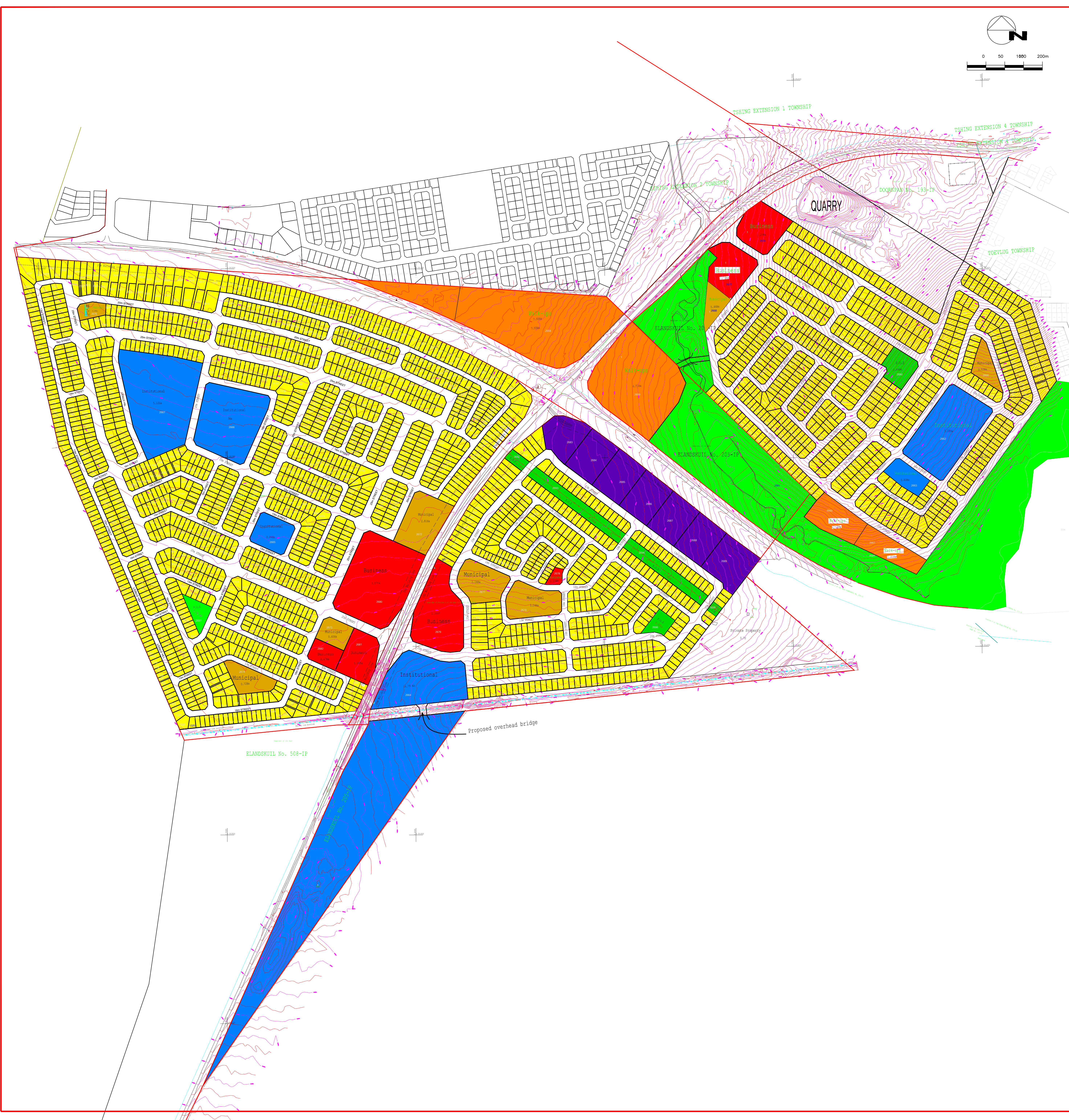
6. REFERENCES

The following documents were used in the investigations in along with personal meetings with the JB Marks Local Municipality's engineering services manager Mr. Fani Zoko based in the Ventersdorp.

- Ventersdorp Local Municipality: 2015/ 2016 Final *Integrated Development Plan*.
- Ventersdorp Local Municipality: 2015/ 2016 Annual Report.

Annexure G

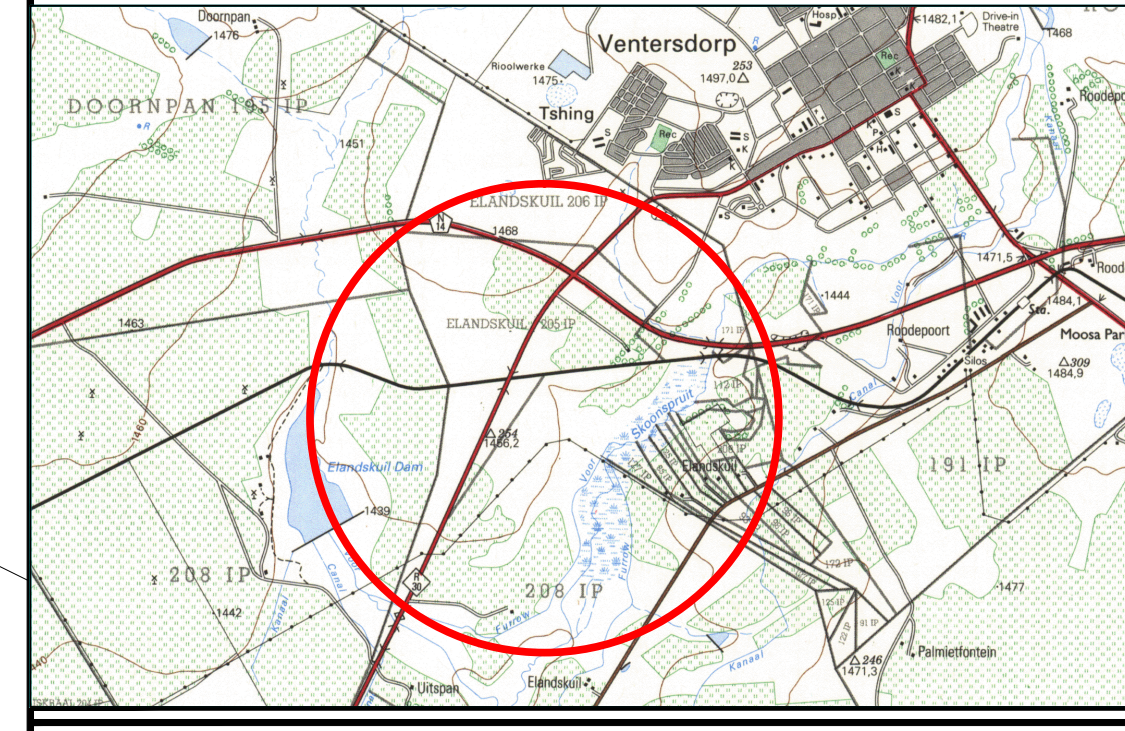
-Layout Plan



PROJECT

PROPOSED TOWNSHIP
 SITUATED ON REMAINDER OF PORTION 3 OF THE FARM ELANDSKUIL No. 205-IP,
 REMAINDER OF THE FARM ELANDSKUIL No. 205-IP,
 REMAINDER OF THE FARM ELANDSKUIL No. 206-IP AND
 REMAINDER OF THE FARM DOORPAN No. 193-IP
 LOCAL AUTHORITY :
 DISTRICT :
 GEODETICAL SYSTEM : Lo 29

LOCALITY SCALE: NTS



LAND USE

ZONING	ERF NO. NUMBERS	No. OF ERVEN	AREA [HA]	% OF AREA
RESIDENTIAL 1	1 - 2657	2657	114.9	44.62
RESIDENTIAL 2	2658 - 2661	4	14.42	5.60
INSTITUTIONAL	2662 - 2667	6	27.43	10.65
BUSINESS	2676 - 2682	7	10.91	4.24
INDUSTRIAL	2683 - 2689	7	7.64	2.97
MUNICIPAL	2668 - 2675	8	7.69	2.99
PUBLIC OPEN SPACE	2690 - 2697	8	27.91	10.84
STREETS			46.59	18.09
TOTAL		2698	257.49	100%

GENERAL NOTES

RESIDENTIAL 1 SITES
 THE MAXIMUM SIZE OF RESIDENTIAL SITES = +/- 2530sqm
 THE MINIMUM SIZE OF RESIDENTIAL SITES = +/- 200sqm
 THE AVERAGE SIZE OF RESIDENTIAL SITES = 15m * 30m [450sqm]
 12.5m * 28m [350sqm]
 TOTAL NUMBER OF UNITS = 2 657 UNITS

RESIDENTIAL 2 SITES
 TOTAL DEVELOPABLE SITE AREA = 131 800sqm - 40%
 = 79 080 sqm /60sqm [Unit size]
 = 1 318 Units * 2 Storeys
 TOTAL NUMBER OF UNITS = 2 636 UNITS

TOTAL NUMBER OF RESIDENTIAL UNITS
 - 2 636 + 2 657
 = 5 293 UNITS

ROADS
 RESERVE WIDTHS OF ALL INTERNAL STREETS ARE INDICATED ON THE PLAN.
 SPLAYS ON ALL STREETS ARE HALF THE WIDTH OF THE STREETS
 MAXIMUM SLOPE ON ROADS IS : 1:40
 MINIMUM SLOPE ON ROADS IS: 1:90

AMENDMENTS

REF	DESCRIPTIONS	ERF No	BY	DATE
Opt 3	Redesign of layout plan	N/A	B.P	Nov, 2017

CLIENT

DESIGNED: B.P.
 DRAWN: MDP
 APPROVED: V.M.
 SCALE: 1:1000
 DRAWING No.: VNT/02/11/17

HDA
 HOUSING DEVELOPMENT AGENCY
 AN AGENCY OF THE DEPARTMENT OF HUMAN SETTLEMENTS

TIN

MDP
 MUNICIPAL DEVELOPMENT PLANNERS
 & PUBLIC MANAGERS