

STELLENBOSCH

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MUNISIPALITEIT • UMASIPALA • MUNICIPALITY

**NOTICE OF MUNICIPAL PLANNING
TRIBUNAL MEETING
OF STELLENBOSCH MUNICIPALITY
FRIDAY, 2024-11-29 FROM
10:00-15:00**

VOLUME 2



**APPLICATION FOR SUBDIVISION: UNREGISTERED ERF 14599 AND 15095,
 STELLENBOSCH**

CONTENT	
ANNEXURES	PAGE NUMBER
ANNEXURE A: Locality Plan	9 - 11
ANNEXURE B: Subdivision approval	12 - 17
ANNEXURE C: Rezoning and Departure approvals	18 - 28
ANNEXURE D: SG and General Plans for Erf 14599, Stellenbosch	29 - 33
ANNEXURE E: SG and General Plans for Erf 15095, Stellenbosch	34 - 39
ANNEXURE F: Motivational report Erf 14599, Stellenbosch	40 - 68
ANNEXURE G: Motivational report Erf 15095, Stellenbosch	69 - 97
ANNEXURE H: Western Cape Department: Environmental Affairs and Development Planning, Development Management (Region 2) LUPA Section 60 Exemption Application.	98 - 136



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DIRECTORATE: PLANNING & ECONOMIC DEVELOPMENT DEVELOPMENT MANAGEMENT: LAND USE MANAGEMENT PLANNING REPORT ON APPLICATION IN TERMS OF SECTION 15(2) OF THE STELLENBOSCH MUNICIPAL LAND USE PLANNING BYLAW

APPLICATION DETAILS

Application Reference	LU/17135 and LU/17116	Commencement Date	10/06/2024
Applicant	Lize Malan	Last day for comments or additional information	02/08/2024
Erf/Farm nr	Unregistered Erf 14599 Unregistered Erf 15095	Place	Cloeteville, Stellenbosch
Zoning	Conventional Residential and Public Road and Parking Zone	Other approvals	Previous subdivision approval lapsed, but zoning of Subdivisional Area Overlay Zone and departures has been implemented and vested.

X TYPE OF APPLICATION

	15(2)(a) rezoning of land*
	15(2)(b) a permanent departure from the development parameters of the zoning scheme
	15(2)(c) a departure granted on a temporary basis to utilise land for a purpose not permitted in terms of the primary rights of the zoning applicable to the land
X	15(2)(d) a subdivision of land that is not exempted in terms of section 24, including the registration of a servitude or lease agreement*
	15(2)(e) a consolidation of land that is not exempted in terms of section 24*
	15(2)(f) a removal, suspension or amendment of restrictive conditions in respect of a land unit*
	15(2)(g) a permission required in terms of the zoning scheme
	15(2)(h) an amendment, deletion or imposition of conditions in respect of an existing approval*
	15(2)(i) an extension of the validity period of an approval
	15(2)(j) an approval of an overlay zone as contemplated in the zoning scheme
	15(2)(k) an amendment or cancellation of an approved subdivision plan or part thereof, including a general plan or diagram*
	15(2)(l) a permission required in terms of a condition of approval
	15(2)(m) a determination of a zoning
	15(2)(n) a closure of a public place or part thereof
	15(2)(o) a consent use contemplated in the zoning scheme
	15(2)(p) to disestablish a homeowners' association
	15(2)(q) to rectify a failure by a homeowners' association to meet its obligations in respect of the control over or maintenance of services

	15(2)(r) a permission required for the reconstruction of an existing building that constitutes a non-conforming use that is destroyed or damaged to the extent that it is necessary to demolish a substantial part of the building
	Approval required in terms of relevant policy for street naming and numbering
	Approval required in terms of Council policies or by-laws – Specify:
	Consent / Permission required in terms of a title deed (includes where planning permission is required in terms of the Advertising on Roads and Ribbon Development Act, Act 21 of 1940)

NATURE AND SCOPE OF PROPOSED LAND USE APPLICATION

The proposed land use applications pertain to the subdivision of Unregistered Erf 14599 and 15095, located in Stellenbosch. These properties are currently zoned Subdivisional Area Overlay Zone for Conventional Residential Zone and Public Road and Parking Zone Erven as per the rezoning approval dated 2008/12/01 (See **ANNEXURE C**)

Building plans has been approved and services implemented as per as-built engineering plans and beneficiaries occupy the dwellings, but registration of the properties never proceeded after the 2005/07/01 approval for the subdivision of the subject Erven (See **ANNEXURE B**).

A subdivision or part thereof is confirmed and cannot lapse when **the following requirements are met** within the period contemplated in Section 22(1) of the Land use Planning Bylaw (2023);

- (a) Approval by the Surveyor-general of the general plan or diagram contemplated in section 20(5).
- (b) Completion of the installation of engineering services in accordance with the conditions contemplated in section 20(4) and other applicable legislation.
- (c) Proof to the satisfaction of the municipality that all the conditions of the approved subdivision that must be complied with before compliance with paragraph (d) have been met in respect of the area shown on the general plan or diagram; **and**
- (d) Registration of the transfer of ownership or certificate of registered title in terms of the Deeds Registries Act of the land unit shown on the diagram or of at least one new land unit shown on the general plan**

As-built plans for the engineering services was confirmed by the municipal engineering department and approved building plans for the housing units was confirmed.

This application seeks to regularise and formalise the original subdivision approval granted in 2005, as per the General Plans attached as **ANNEXURE D & E** to enable the transfer of the properties to the beneficiaries, which was never finalised.

ASSESSMENT CHECKLIST

CONSIDERATION CRITERIA	YES	NO	Comments, if any
Accurate public participation processed followed	X		The public participation process was exempted by the Western Cape Department: Environmental Affairs and Development Planning, Development Management (Region 2) in terms of Section 60 of the Western Cape land Use Planning Act (Act 3 of 2014) due to the full public participation already being undertaken in the previous application and nothing has changed to the development to be implemented.

			This application is now solely to register the individual subdivisonal erven, which was never proceeded with.
Conditions imposed by departments	X		None
DCs applicable		X	
Objections received		X	
Proposal complies with applicable laws, policies, guidelines, the IDP and technical requirements in terms of Section 65	X		

DESIRABILITY CONSIDERATIONS IN TERMS OF SECTION 65 OF THE BYLAW

Socio-economic impact	<ul style="list-style-type: none"> - Facilitates property transfers to beneficiaries. - Empowers households as homeowners. - Provides security of tenure and financial stability. - Allows property to serve as collateral for loans.
Compatibility with surrounding uses	<ul style="list-style-type: none"> - Duplex units already built and occupied in a primary residential area. - Will be compatible with surrounding privately owned properties. - Subdivision and transfer align with the area's existing character of private ownership.
Impact on the external engineering services	<ul style="list-style-type: none"> - Properties already serviced for approved building plans and no impact on external engineering services are envisaged.
Impact on safety, health and wellbeing of the surrounding community	<ul style="list-style-type: none"> - Units constructed in 2007/2008 and integrated into the local area. - No impact on current safety, health, and wellbeing conditions.
Impact on heritage	<ul style="list-style-type: none"> - No impact, as no historical buildings or protected areas exist in close proximity to the development.
Impact on the biophysical environment	<ul style="list-style-type: none"> - No impact.
Traffic impacts, parking, access and other transport related considerations	<ul style="list-style-type: none"> - Traffic and access impacts already manifested. - Departure from the parking requirements was previously approved, to relax the required parking from two (2) parking bays to none (0) parking bays not to provide parking onsite. Although car owning beneficiaries already made provision for onsite parking. Parking in public roads which is not prohibited is also an occurrence.
Whether the imposition of conditions can mitigate an adverse impact of the proposed use or development of land	<ul style="list-style-type: none"> - As mentioned the project has already physically been implemented and this application is only to regularise the alienation of individual erven for ownership to the beneficiaries occupying the dwellings.

KEY FINDINGS OF PLANNING EVALUATION

The proposed subdivision is compatible with the surrounding area, poses no new environmental or heritage impacts, and offers significant socio-economic benefits.

This proposal is only for the regularisation of the subdivision alignment and the unauthorised construction of additional structures will have to be dealt with from building management perspective once the cadastral properties aligned to the general Plan has been approved.

After having independently considered and weighted all the relevant information the evaluation of the subject land use and land development application concludes that:

1. **Compatibility with Existing Residential Use:** The proposed subdivision formalises an existing residential area where duplex units are already constructed and occupied. The land use is consistent with surrounding privately owned residential properties, ensuring that the development is compatible with the established character of the area.
2. **Minimal Environmental and Heritage Impact:** The subdivision and transfer of properties will have no new impact on the biophysical environment or heritage resources, as the implementation of the development dates back to 2007/2008, and no additional construction is proposed other than the approved building plans per Erf.
3. **No Adverse Impact on Infrastructure and Services:** The properties are already fully serviced by municipal infrastructure services section, and the subdivision will not place additional demands on external engineering services. The existing infrastructure is sufficient to support the proposed land use without any adverse effects.
4. **Positive Socio-Economic Outcome:** The transfer of ownership to beneficiaries will empower households by providing security of tenure and potential financial stability. The proposal supports the long-term socio-economic development of the area, benefiting both current and future generations.

The subject land use and land development application is, having regard to the conclusions above, viewed as consistent with the relevant Stellenbosch Municipality's Spatial Development Framework (2023), Land Use Planning By-Law (2023) and Zoning Scheme By-Law (2024) and consequently grounds for the support of the subject subdivision application.

List relevant plan numbers	<p>SG Diagrams No. 4716/2006 for Erf 14599, Stellenbosch: General Plan No. 4717/2006 for Erf 14599, Stellenbosch:</p> <p>SG Diagrams No. 4719/2006 for Erf 15095, Stellenbosch: General Plan No. 4720/2006 for Erf 15095, Stellenbosch:</p>
List annexures to decision	<p>ANNEXURE A: Locality Plan ANNEXURE B: Subdivision approval. ANNEXURE C: Rezoning and Departure approvals. ANNEXURE D: SG and General Plans for Erf 14599, Stellenbosch ANNEXURE E: SG and General Plans for Erf 15095, Stellenbosch ANNEXURE F: Motivational report Erf 14599, Stellenbosch ANNEXURE G: Motivational report Erf 15095, Stellenbosch ANNEXURE H: Western Cape Department: Environmental Affairs and Development Planning, Development Management (Region 2) LUPA Section 60 Exemption Application.</p>

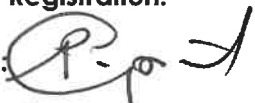
ASSESSMENT RECOMMENDATION BY TOWN PLANNER

The proposed land use and land development application has been duly evaluated in terms of process and desirability with the recommendation for consideration.

Name: P April

Capacity: Senior Town Planner

SACPLAN Registration:

Signature: 

Date: 11/11/2024

REVIEW OF ASSESSMENT AND RECOMMENDATION

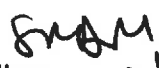
The recommendation for decision is hereby submitted for consideration to the authorised decision-maker in accordance with the System of Delegations OR Categorisation Model approved in terms of Section 69 of the said Bylaw vide Item 11.8.1 dated 24 May 2023.

Category / Delegation Item Number: D(c)5

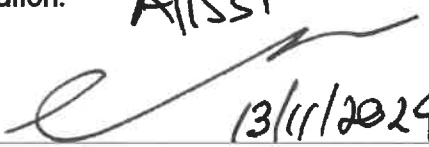
Decision Making Authority: MPT

Rational: Application on initiative of Council ~~or~~ on Council owned land.

Name: 

Capacity: 

SACPLAN Registration: A/1531

Signature: 

Date: 13/11/2024

MPT ADMINISTRATION OF PLANNING APPLICATION ASSESSMENT REPORT**Administrator to Stellenbosch Municipal Planning Tribunal:**

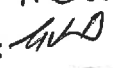
It is hereby confirmed that proper notice was served of the Municipal Planning Tribunal meeting at which this land use and land development application will serve for consideration.

The land use and land development application will serve at the scheduled meeting of the Stellenbosch Municipal Planning Tribunal on:

Date: 14-11-2024.....

Name: Chrizelle Kriel

Capacity: MPTM

Signature: 

Date: 14-11-2024



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RECOMMENDATION:

1. That the following application(s) in terms of Section 15(2) of the Stellenbosch Municipal Land Use Planning Bylaw, namely:
 - 1.1. The Subdivision in terms of Section 15(2)(d) of the said Bylaw of Unregistered Erf 14599, Stellenbosch (consisting of the consolidation in terms of Section 15(2)(e) of the said Bylaw of Erf 6667, 6852, 14567 and 14598, Stellenbosch) into 90 Conventional Residential Zone Erven and Remainder Roads (Public Road and Parking Zone) erven and the registration of 2m stormwater servitudes, 2m services servitudes and 5m foul sewer servitude
 - 1.2. The Subdivision in terms of Section 15(2)(d) of the said Bylaw of Unregistered Erf 15095, Stellenbosch (A portion of Erf 6846, Stellenbosch) into 74 Conventional Residential Zone Erven and a Remainder Road (Public Road and Parking Zone – Erf 15097) and the registration of pipeline and services servitudes.

BE APPROVED in terms of Section 60 of the said Bylaw and subject to conditions of approval.

2. The approval is subject to the following **conditions** imposed in terms of Section 66 of the said Bylaw:
 - 2.1 The approval only applies to the applications as indicated above and shall not be construed as authority to depart from any other legal prescriptions or requirements from Council or other legislation or bylaws or regulations that may be applicable.
 - 2.2 The proposed subdivisions be implemented in accordance to General Plan No 4717/2006, surveyed by D. P Burger dated May 2004 – June 2006 and General Plan No 4720/2006, surveyed by M. B. Straughan dated May 2004 – June 2006 attached as **ANNEXURE D & E.**

- 2.3 An electronic copy (shp, dwg, dxf) of the subdivisinal plans be submitted to the Directorate Planning and Economic Development for record purposes, which plan must indicate the following information:

2.3.1 Co-ordinates

2.3.2 Survey dimensions

- 2.4 The servitudes be registered in the title deeds of the applicable property/ies on registration.

- 2.5 The approval granted shall not exempt the applicant from complying with any other legal prescriptions or requirements that might have a bearing on the approved land uses.

3. The reasons for the above decision are as follows:

- 3.1. The subdivisions formalize the existing residential area, where duplex units are already constructed and occupied, ensuring compatibility with surrounding privately owned residential properties.
- 3.2. The proposed subdivision will not result in adverse impacts on the biophysical environment or heritage resources, as the development was established in 2007/2008, with no new construction planned.
- 3.3. The subdivision does not place additional demands on infrastructure or services, as the properties are already fully serviced and no upgraded engineering services are required.
- 3.4. The transfer of ownership to beneficiaries will positively impact the community by providing security of tenure and supporting socio-economic stability for both current and future residents.
- 3.5. The proposal which is within an urban edge aligns with the relevant planning frameworks and legislation, including the Stellenbosch Municipality's Amended Spatial Development Framework (2023), Land Use Planning By-Law (2023), and Zoning Scheme By-Law (2024).

4. Matters to be noted:

- 4.1. None.

ANNEXURE A:

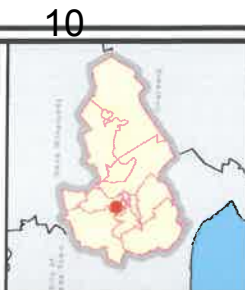
Locality Plan

Unregistered Erf 14599, Stellenbosch, Cloetesville

SCALE

1:2 256.99

Legend



Stellenbosch Municipality
Planning & Economic Development
Created by: Corporate GIS

Date: 2024/09/04



Author: Stellenbosch Municipality



Stellenbosch Municipality
Street Address:
Mein Street, Stellenbosch, 7600
Tel: 021 808 8658

This map is a representation of the information currently held by the Government of the Republic of China. Every effort has been made to ensure the accuracy of the product. General acceptance is not a warranty for any errors or omissions nor for any loss or damage caused by the use of the product. The product is not intended to be used by anyone as a result of the production of the map and the information on it.



Unregistered Erf 15095, Cloeteville, Stellenbosch

SCALE

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Legend



Stellenbosch Municipality
Planning & Economic Development
Created by: Corporate GIS

Date: 2024/09/04



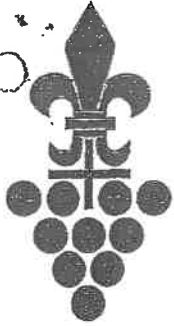
Author: Steffenbosch Municipality



Stellenbosch Municipality
Street Address:
71 Plain Street, Stellenbosch, 7600
Tel: 021 808 8558

[illegible]

ANNEXURE B:
Subdivision approval.



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My Ref: Erf 6846 & 6852 (8833433 – E. van der Merwe)

2005-07-01

Friendlander Burger & Volkman
27 Church Street
STELLENBOSCH
7600



Att: Mr. D. Burger

Sir

SUBDIVISION OF ERVEN 15095 and 14599, CLOETESVILLE, STELLENBOSCH

My Council has in terms of Section 25 of Ordinance 15 of 1985 granted approval for the subdivision of the abovementioned properties as indicated on the attached subdivisional plans.

This approval is however subject to the following:

1. The approved General Plans must be submitted to the office for record and final registration purposes;
2. The requirements as stated in regulations 3.5 and 3.6 of the Scheme Regulations which have been promulgated in terms of Section 7(2) of Ordinance 15 of 1985 (PN 1047/1988) must be complied with; and
3. Services must be provided to the subdivision in accordance with Regulation 39 of the regulations promulgated in terms of Section 47(1) of Ordinance 15 of 1985. (In this regard your attention is invited to the Provincial Administration Circulars LG/PB 15/1986 dated 1986-06-20 and LG/PB 17/1986 dated 1986-07-09.

Yours faithfully

**Programme Manager Planning
(E. van der Merwe)**

GDR

(STELLENBOSCH ALLOTMENT AREA)

GENERAL PLAN NO. /2004

of

Subdivision of Erf 15095 Stellenbosch

vide S.G. Diagram No. /2004 annexed to D/T No. and comprising 74 erven numbered 15098 - 15169

Situate in the Municipality of Stellenbosch
Administrative District of Stellenbosch
Province of Western Cape

Stellenbosch Municipality
Municipality Stellenbosch

Block: ...

This subdivision is in accordance with the provisions of the Municipalities Act No. 100 of 1998 and the provisions of the Subdivision Act No. 15 of 1982 subject to the conditions as per annexure.

Date: 20/07/01

Stellenbosch Municipality
Municipality Stellenbosch

Block: ...

This subdivision is in accordance with the provisions of the Municipalities Act No. 100 of 1998 and the provisions of the Subdivision Act No. 15 of 1982 subject to the conditions as per annexure.

Date: 20/07/01

Stellenbosch Municipality
Municipality Stellenbosch

Block: ...

This subdivision is in accordance with the provisions of the Municipalities Act No. 100 of 1998 and the provisions of the Subdivision Act No. 15 of 1982 subject to the conditions as per annexure.

Date: 20/07/01

NO. 15098

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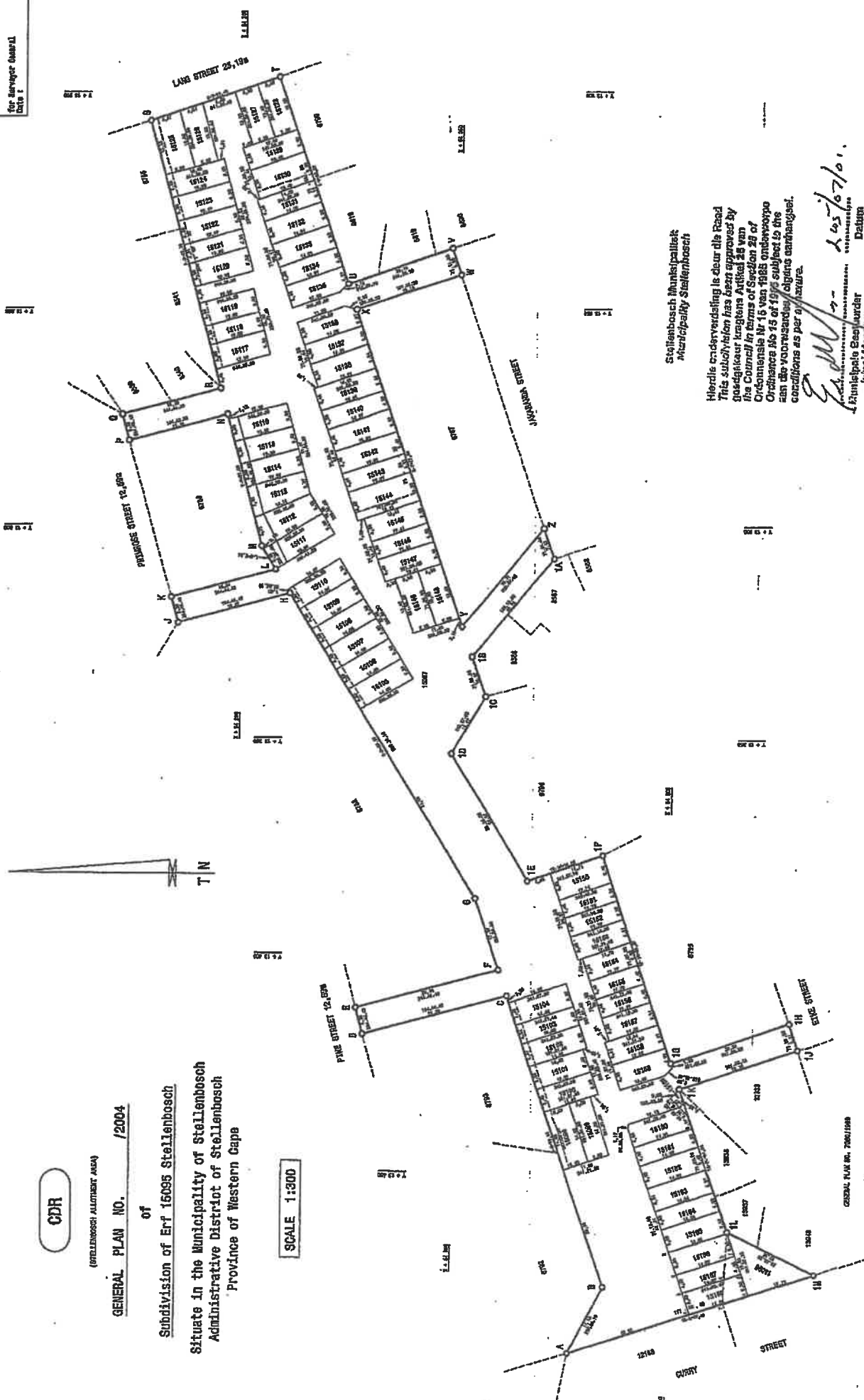
15165

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Stollenbosch Munkispallitz
Municipality Stollenbosch

Hierdie onderverdeling is deur die Raad van die Unie goedgekeur. Hierdie besluit is goedgekeur volgens Artikel 25 van die Grondwet van 1996, soos verander deur die Wet van 1998, en is onderwerp aan die voorwaardelike goedkeuring van die Parlement.

205/07/01.

FEDERAL BUREAU OF INVESTIGATION

GENERAL PLAN NO. /2004

CDR

(STELLENBOSCH ALLOCMENT AREA)

Subdivision of Erf 14599 Stellenbosch

vide S.G. Diagram No. /2004 annexed to D/T No. and comprising 80 erven numbered 15172 - 15281 and Streets

situate in Cloetesville Township

in the Municipality of Stellenbosch

Administrative District of Stellenbosch

Province of Western Cape

Consent of the Municipality of Stellenbosch

This L.C. application has been approved by the Council in terms of Section 25 of the Communal Property Act 1985 and the Ordinance No. 15 of 1985 subject to the conditions of the application.

[Signature]
Municipal Engineer

[Signature]
Municipal Manager

Date: 2004/07/01

Consent of the Municipality of Stellenbosch

This L.C. application has been approved by the Council in terms of Section 25 of the Communal Property Act 1985 and the Ordinance No. 15 of 1985 subject to the conditions of the application.

[Signature]
Municipal Engineer

[Signature]
Municipal Manager

Date: 2004/07/01

**Stollenbosch Kunstspalittel
Municipality Stellenbosch**

Helyo: "diversdulling te deur die Raad
 This resolution has been approved by
 Goedeputten kragtens Artikel 28 van
 die Council in terms of Section 28 of
 Ordinance No 15 van 1989 onderworf
 Ordinance No 15 of 1989 subject to the
 die voorskrifte en volgens ooreenkomstige
 conditions as per Statuut.

[Handwritten signature]
Dated
06/07/01

CDR

(STELLERBUSH ALLOTMENT AREA)

GENERAL PLAN NO. /2004

of

Subdivision of Erf 14599 Stellenbosch

Situate in Clootshville Township
in the Municipality of Stellenbosch
Administrative District of Stellenbosch
Province of Western Cape

SCALE 1:200

9006 ELMH I 8048

U.S. FILE NO.
SERIALS SECTO ;
COMPIATION ; 1971-1971 (1971)
1971-1971 (1971)

ANNEXURE C:
Rezoning and Departure approvals.



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Navrae / Enquiries	P April
U verwysing / Your ref.	-
Ons verwysing / Our Ref .	Erf 14599 and 15095, Stellenbosch
Datum / Date	2008-12-01
Telefoon / Telephone	021-808 8683
Faks / Fax	021-808 8651

BY HAND

Director: Housing and Social Services

Attention: Mr L Van Stavel

Sir

APPLICATION FOR REZONING AND DEPARTURE: ERF 14599 AND 15095, STELLENBOSCH

The application in the above regard, refers.

The Director: Planning and Environment at a recent meeting resolved as follows:

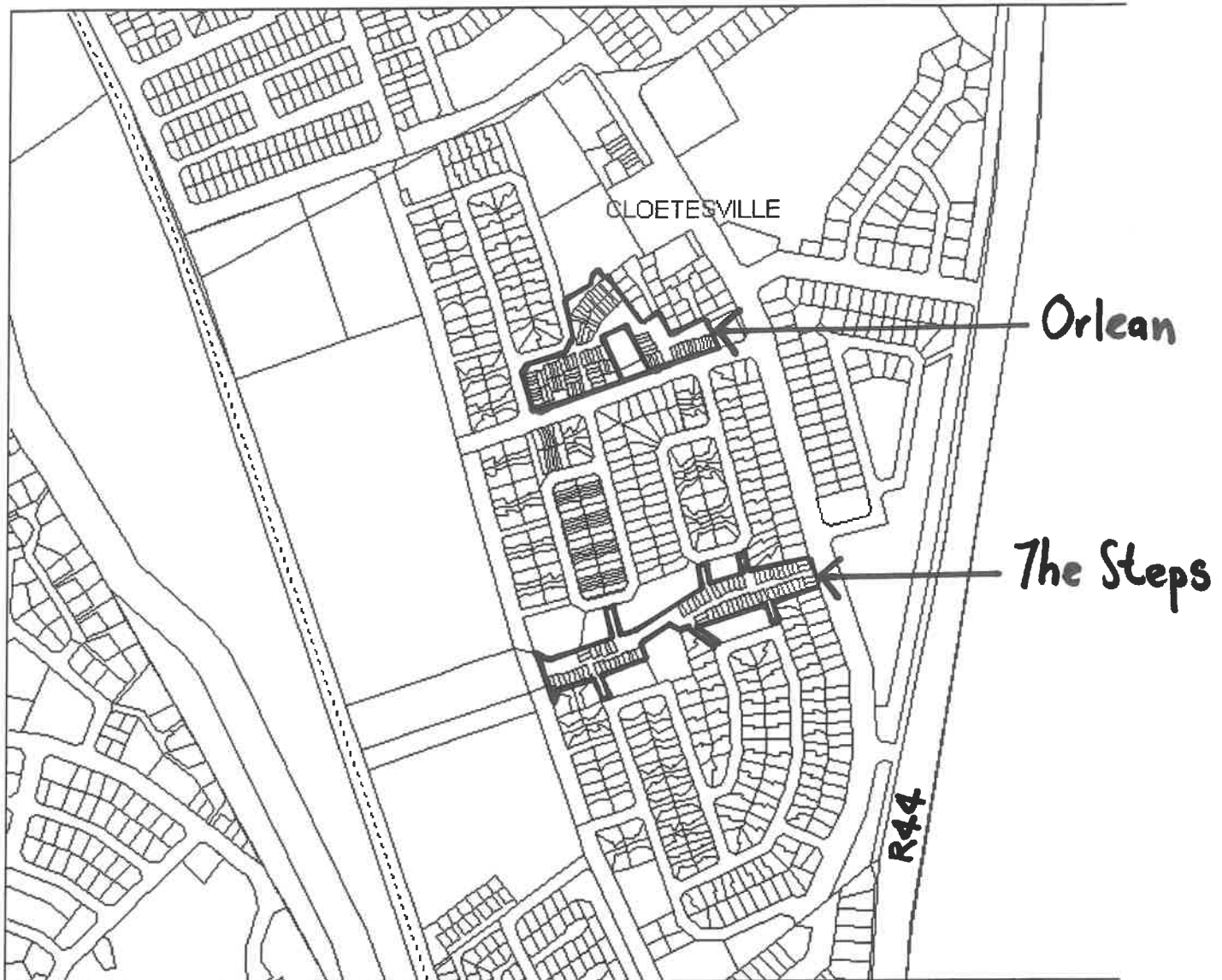
1. That **approval be granted** in terms of section 17(2) of the Land Use Planning Ordinance, 1985 (No 15 of 1985), for the **rezoning** of Erf 14599, Stellenbosch from Specific Business, Local Authority and Public Open Space to Subdivisional area to allocate the zoning of Grouphousing to 90 unregistered portions of Erf 14599 (Erven 15172 to 15261) and a zoning of Local Authority to the Remainder Road as per General Plan No 4717/2006, Surveyed by D. P Burger and drawing 02.954/AC/2 drawn by Chittenden Nicks de Villiers, dated 09 June 2004 (See **APPENDIX 3**).
2. That **approval be granted** in terms of section 16 of the Land Use Planning Ordinance, 1985 (No 15 of 1985), for the **rezoning** of Erf 15095, Stellenbosch from Public Open Space to Subdivisional area to allocate the zoning of Grouphousing to 72 unregistered portions of Erf 15095 (Erven 15098 to 15169) and a zoning of Local Authority (Street purposes) to two unregistered portions (Erven 15096 and 15097) as per General Plan No 4720/2006, Surveyed by M B Straughan and drawing 01- subdivision-04-06-30, drawn by Chittenden Nicks de Villiers, dated 25 June 2004 (See **APPENDIX 4**).
3. That **approval be granted** in terms of section 15 of the Land Use Planning Ordinance, 1985 (No 15 of 1985), for a departure in order to relax;
 - (a) The street building line to 1m and the common building lines to 0m, provided that where a building is erected less than 1m from a side boundary no doors or windows shall be permitted in the wall concerned, provided further that if a midblock sewage system is provided, a rear building line of up to 2m may be required by Council.
 - (b) The minimum common open space of 40m² per dwelling to 0m.
 - (c) The two required parking bays for a dwelling unit to none.

P 19-01009

Tauraras
for DIRECTOR: PLANNING AND ENVIRONMENT

APPENDIX 2

STELLENBOSCH GIS MAP



Cloeteville
Stellenbosch



[illegible]

ISS & OFFICE NOTES

STELLENBOSCH ALLOTMENT AREA)

40

Subdivision of Erf 14599 Stellenbosch

vide S.G. Diagram No. 4716/2008 annexed to D/T No. 15172 and comprising 90 erven numbered 15172 - 15261 and Roads

[illegible]

Surveyed by me in accordance with the
Land Survey Act No. 8/1997

DB
D.P. MASON (PLS 0080)
Professional Land Surveyor
Date: 1 May 2004 - June 2006

SD NO. 4717/2006

SHEET 2 OF 2 SHEETS

Approved :

for Surveyor General
Date : 7 Jan. 2006

T N

GENERAL PLAN NO. 1678

GENERAL PLAN NO. 8937

GENERAL PLAN NO. 8937

VREDERUST STREET 12,50m

CDR

(STELLENBOSCH ALLOTMENT AREA)

GENERAL PLAN NO. 4717 /2006

of

Subdivision of Erf 14599 Stellenbosch

Situate in Cloetesville Township in Stellenbosch Municipality
Administrative District of Stellenbosch
Province of Western Cape

SCALE 1:200

Revised by me in accordance with the
Land Survey Act No. 17/1987

[Signature]
D.A. BLOOMFIELD
Professional Land Surveyor
Date : 14 May 2006

P.L. FILE NO. SHEET NO.
SD NO. 4717/2006
COMPLETION : 2006/1941 (2005)
LP 125121/1

Fig. 6.2

ORLEAN PILOT HOUSING

DRAFT DEVELOPMENT PLAN

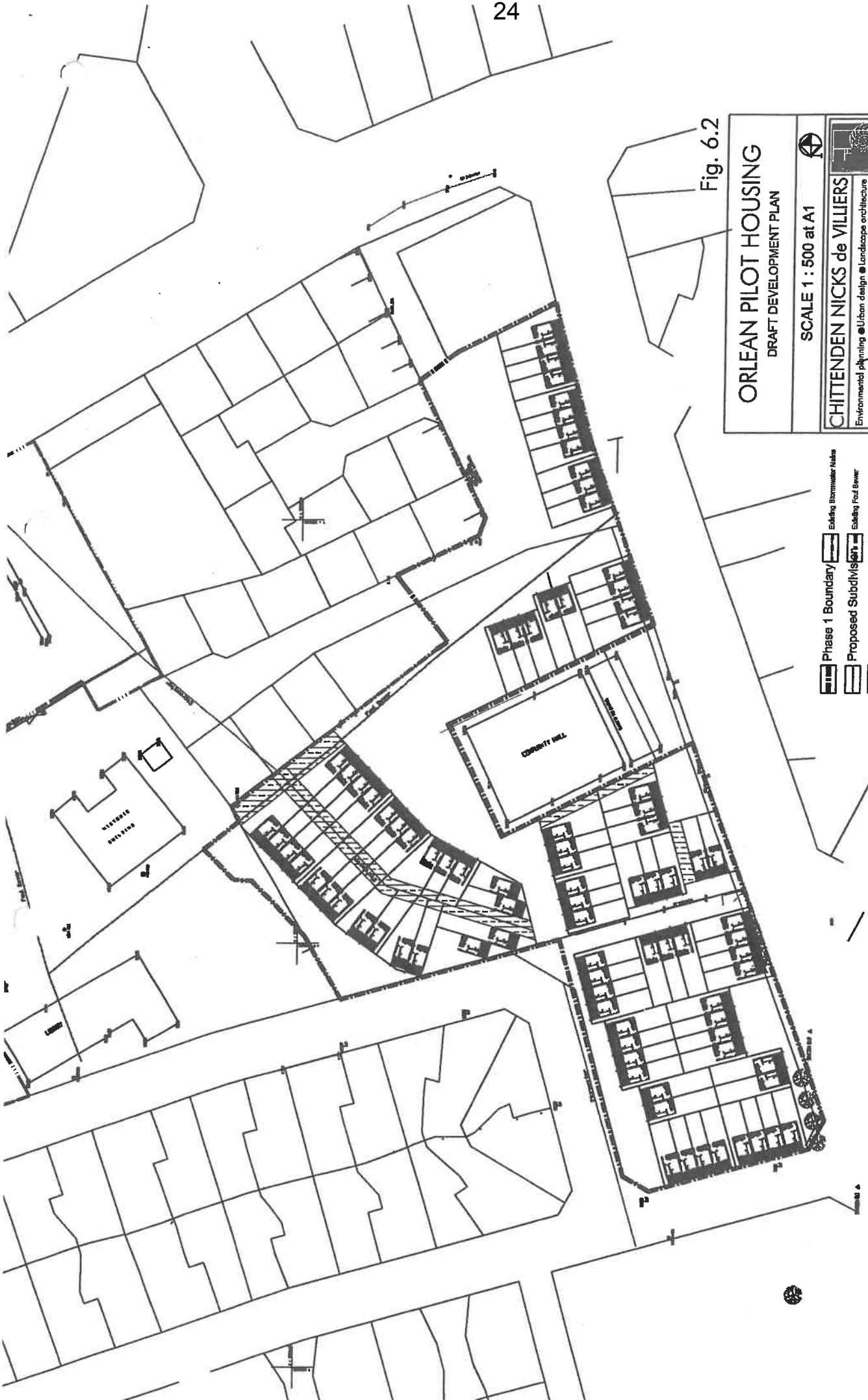
SCALE 1 : 500 at A1



CHITTENDEN NICKS de VILLIERS	
Environmental planning • Urban design • Landscape architecture	
72 Barnack Street Cape Town PO Box 102110 Oshana Square 7800	
Tel. 461 6502 Fax. 461 6486 E-mail: cn@chittenden.co.za	
Job: 02.054	Draw: 02.054/AC/2
Date: 15 JUNE 04	

- Phase 1 Boundary
- Existing Stormwater Nalms
- Proposed Subdivision
- Existing Foul Sewer
- Proposed Servitude
- Proposed Foul Sewer
- Erf 6852 Boundary
- Water

1:500



RECEIVED

[illegible]

(STELLENGESCH ALLOTMENT AREA)

GENERAL PLAN NO. 4720 / 2006

Subdivision of Erf 15095 Stellenbosch

vide S.G. Diagram No. 4719 /2006 annexed to D/T No. and comprising 74 erven numbered 15096 - 15169

Situate in the Municipality of Stellenbosch
Administrative District of Stellenbosch
Province of Western Cape

Surveyed by me in accordance with the
Land Survey Act No. 8/1987

B. B. B.

E.S. STRAZAR (PLS 0907)
Professional Land Surveyor
Date: May 2004 - July 2006

Reason Description	
0	Own standard section
10	From iron peg in tie
15 1A 1E 1G	Nails in tie
19 1A	Nails in concrete
1C	Mark on roof
All other reasons	From iron peg
Performance Marks	
1000 10007	From driveway marks

SR NO. 4720/2006

SHEET 2 OF 2 SHEETS

Approved :

For Surveyor General

Date : 2006-04-01

CDR

(STELLENBOSCH ALLOTMENT AREA)

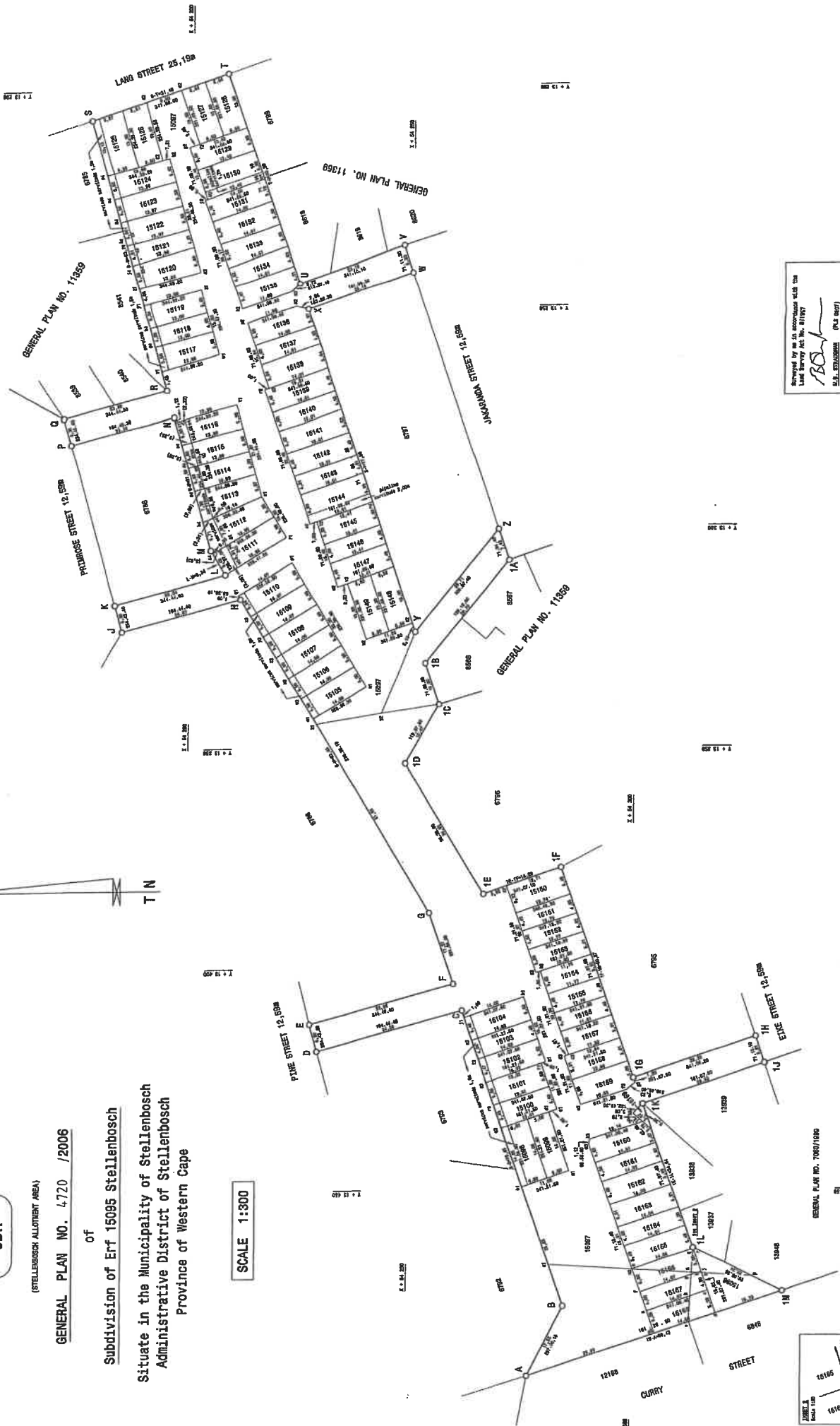
GENERAL PLAN NO. 4720 /2006

of

Subdivision of Erf 15095 Stellenbosch

Situate in the Municipality of Stellenbosch
Administrative District of Stellenbosch
Province of Western Cape

SCALE 1:300



Surveyed by me in accordance with the

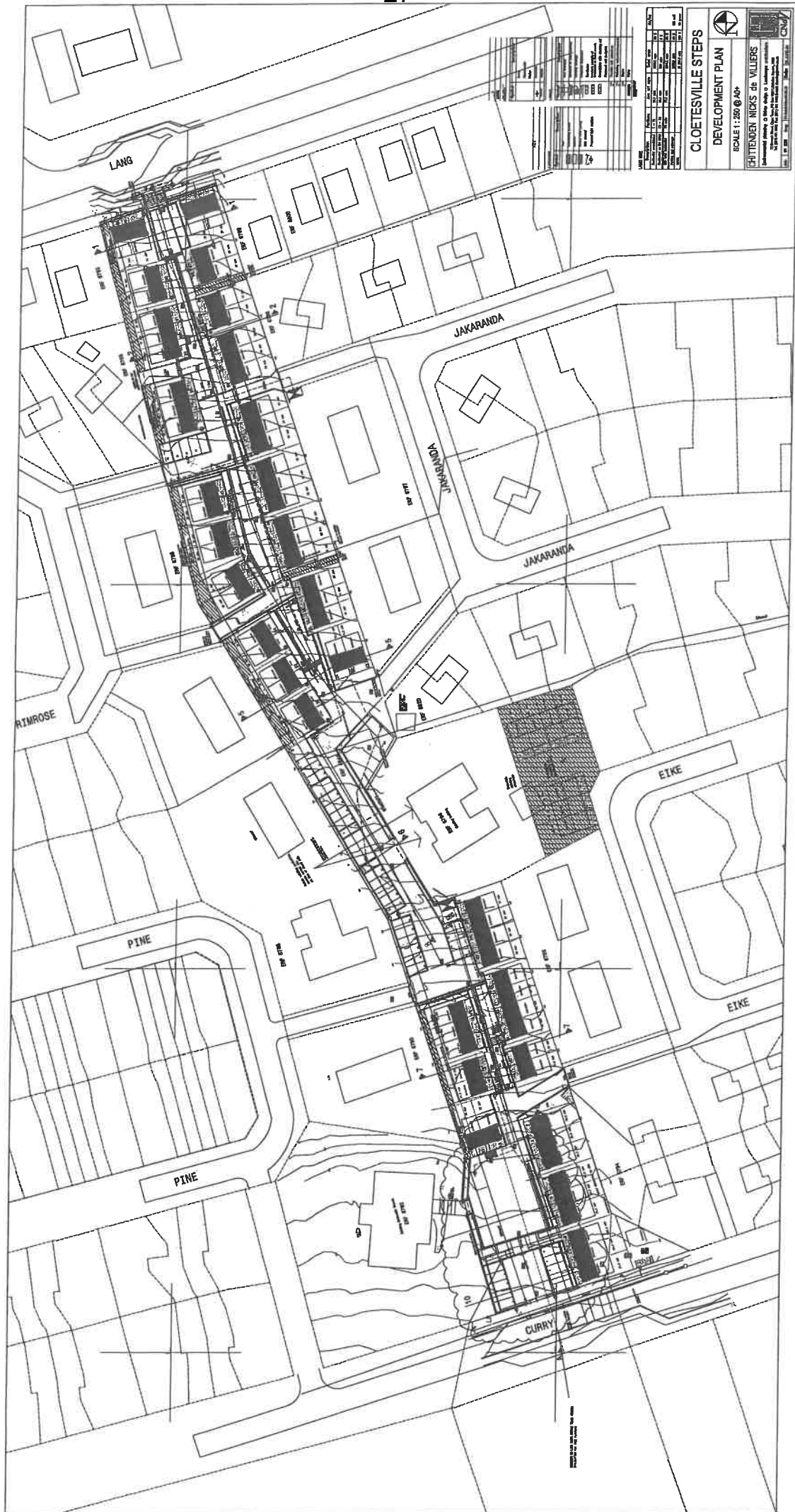
Land Survey Act No. 56 of 1957

J.A. STAMMER (P.L. 2007)

Professional Land Surveyor

Date 1 May 2006 - July 2006

S.O. FILE NO. 51455 (VR)
SHEET NO. 1 OF 2
COMPLETION 1 MAY 2006 (0007)
L.A. LANGEZEE



ANNEXURE D:

SG and General Plans for Erf 14599, Stellenbosch

Note:

The figure EaMNPQxnWXYe represents freehold land
the remainder is quitrent.

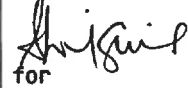
Components:

1. The figure ABCDeZA1 represents Erf 6667 Stellenbosch,
vide General Plan No. TP.7873
2. The figure EaMbcdVWXYe represents Remainder Erf 6852 Stellenbosch
vide Dgm. No. 9149/1986, D/T 1987- -30472
3. The figure FGHIJKLa represents Erf 14597 Stellenbosch
vide Dgm. No. 4714/2006, D/T
4. The figure bNPQRSTUdc represents Erf 14598 Stellenbosch
vide General Plan No. 11678

S.G. No.

4716/2006

Approved.



for

Surveyor - General

Date : 2006 07.31

SHEET 1 OF 2 SHEETS

The figure A B C D E F G H J K L M N P Q R S T U V W X Y Z A1
represents 1,1164 hectares

of land, being

ERF 14599 STELLENBOSCH and comprises 1. to 4. as above

Situate in Cloetesville Township in Stellenbosch Municipality
Administrative District of Stellenbosch
Compiled in July 2006
by me

Province of Western Cape

PLS 0080 D P Burger Pr Land Surveyor

This diagram is annexed to
No.
Dated
i.f.o.

The original diagrams are
as quoted above

File No. Stel. 81 vol. 5
S.R. No. Compiled
Comp. BHSZ-1241 (6933)
BHSZ-1243 (6935)
LPI C0670022

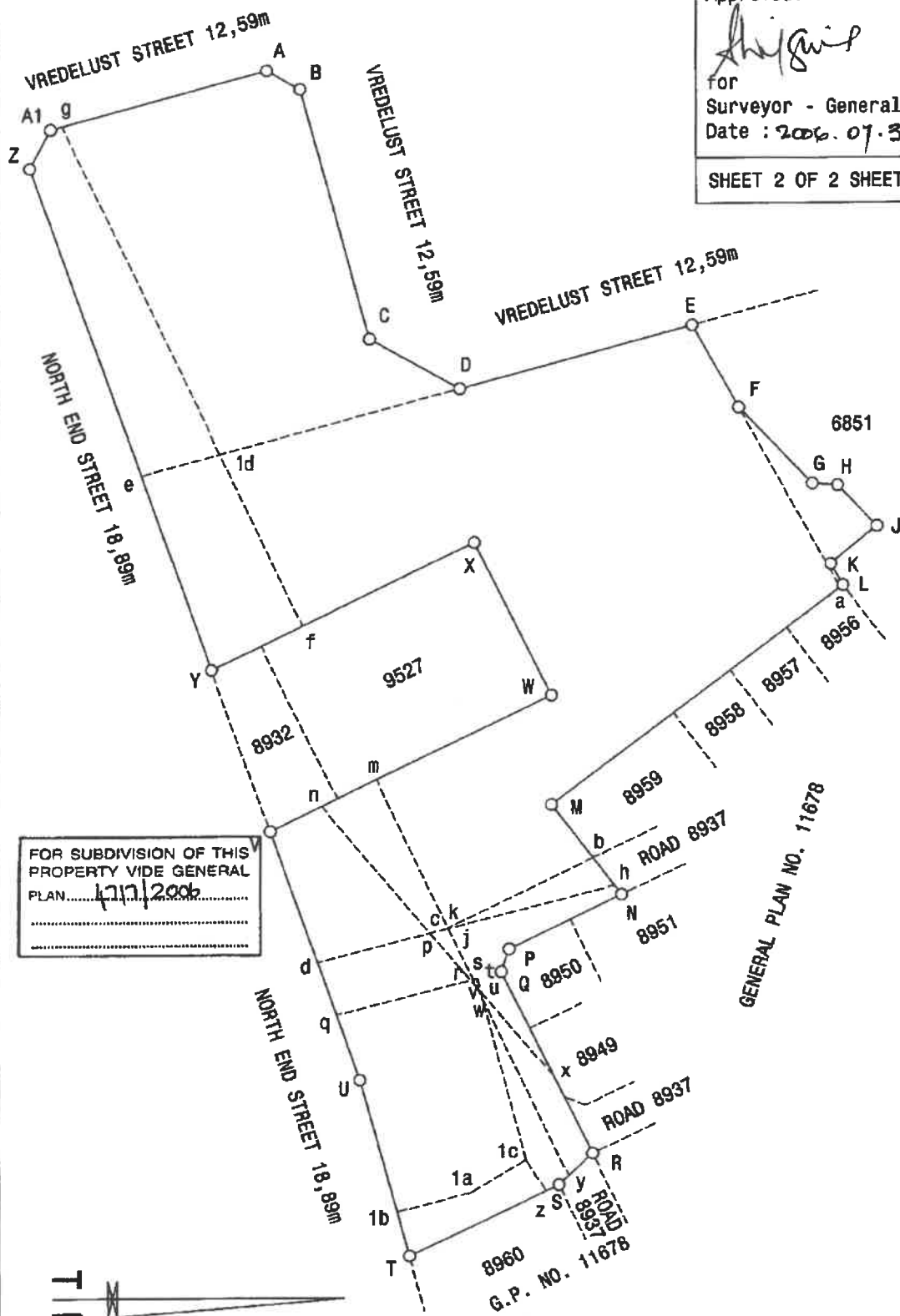
Registrar of Deeds

Erf 14599 Stellenbosch

Administrative District of Stellenbosch

for
Surveyor - General
Date : 2006.07.31

SHEET 2 OF 2 SHEETS



FOR SUBDIVISION OF THIS
PROPERTY VIDE GENERAL
PLAN.....L7712006.....

GENERAL PLAN NO. 11678

Compiled in July 2006
by me

SCALE 1 : 1000

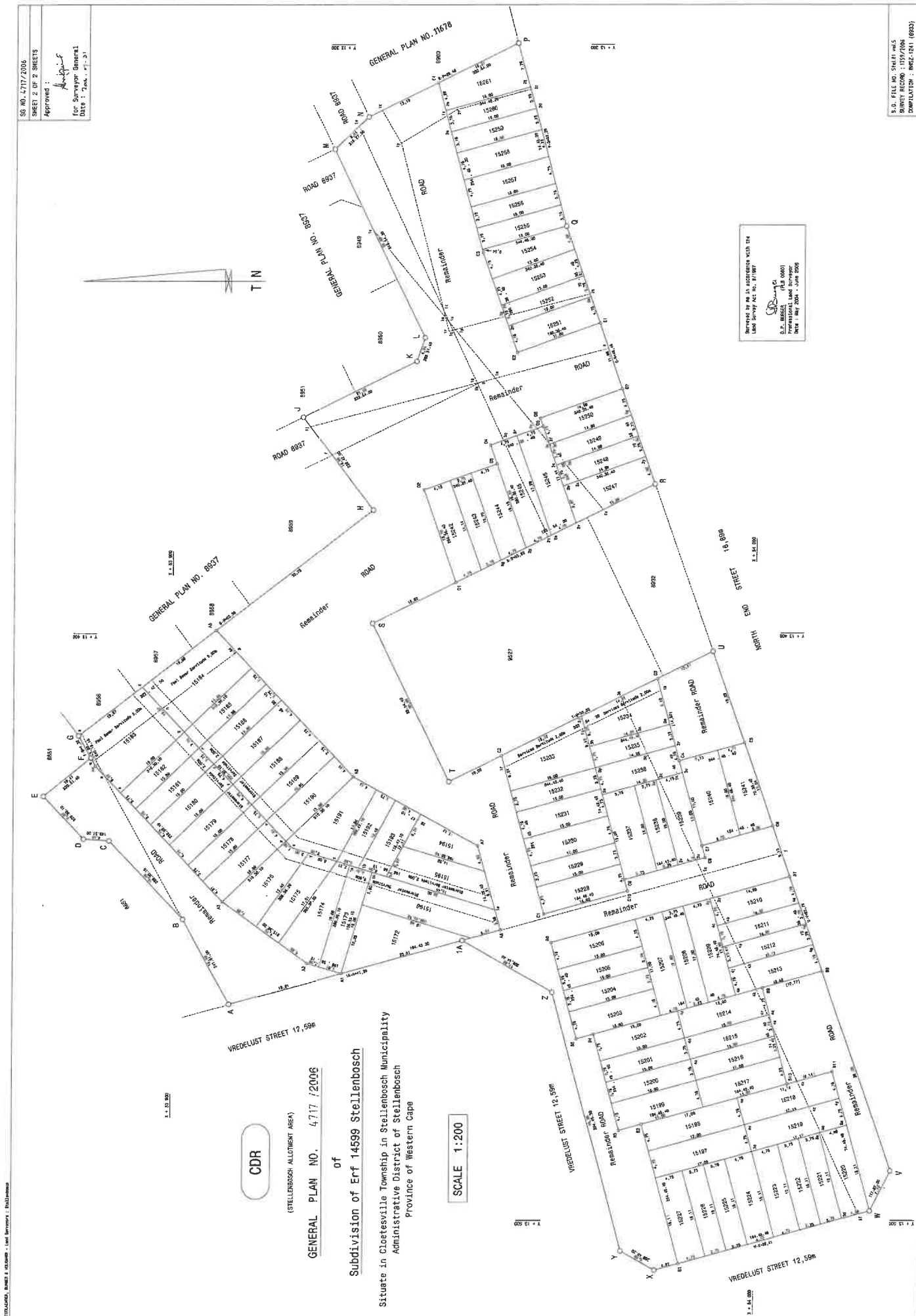
PLS 0080

D P Burger

Pr Land Surveyor

Erf 14599 Stellenbosch

[illegible]

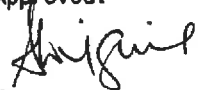


ANNEXURE E:

SG and General Plans for Erf 15095, Stellenbosch

GENERAL PLAN T.P. 7873...

Friedlaender, Burger & Volkmann - Land Surveyors

SIDES Metres		ANGLES OF DIRECTION	CO-ORDINATES System WG 19°		S.G. No.
			Y	X	
		Constants :	0,00	0,00	4719/2006
AB	17,53	297 00 10	A + 13492,19	+ 3754277,37	Approved.  for Surveyor - General Date : 2006.08.01
BC	70,85	251 06 30	B + 13476,57	+ 3754285,33	
CD	34,28	164 44 40	C + 13409,54	+ 3754262,39	SHEET 1 OF 3 SHEETS
DE	6,30	254 43 40	D + 13418,56	+ 3754229,32	
EF	33,86	344 45 40	E + 13412,48	+ 3754227,66	
FG	17,27	251 06 50	F + 13403,58	+ 3754260,33	
GH	83,65	238 38 10	G + 13387,24	+ 3754254,74	
HJ	26,87	164 44 40	H + 13315,81	+ 3754211,20	
JK	6,30	254 43 40	J + 13322,88	+ 3754185,28	
KL	25,04	344 44 30	K + 13316,80	+ 3754183,62	
LM	6,34	238 37 00	L + 13310,21	+ 3754207,78	
MN	31,69	254 44 20	M + 13304,80	+ 3754204,48	
NP	23,28	164 45 30	N + 13274,23	+ 3754196,14	
PQ	6,30	254 43 40	P + 13280,35	+ 3754173,68	
QR	23,29	344 44 30	Q + 13274,27	+ 3754172,02	
RS	63,70	254 45 20	R + 13268,14	+ 3754194,49	
ST	31,48	341 08 00	S + 13206,68	+ 3754177,74	
TU	50,39	71 08 10	T + 13196,50	+ 3754207,53	
UV	25,19	341 10 10	U + 13244,18	+ 3754223,82	
VW	6,30	71 11 30	V + 13236,05	+ 3754247,66	
WX	25,18	161 08 30	W + 13242,01	+ 3754249,69	
XY	77,59	71 08 20	X + 13250,15	+ 3754225,86	
YZ	29,71	309 07 40	Y + 13323,57	+ 3754250,94	
ZA1	7,43	71 04 40	Z + 13300,52	+ 3754269,69	
A1B1	29,70	129 10 00	A1 + 13307,55	+ 3754272,10	
B1C1	10,00	71 08 50	B1 + 13330,58	+ 3754253,34	
C1D1	15,47	119 37 50	C1 + 13340,04	+ 3754256,57	
D1E1	34,62	58 38 00	D1 + 13353,49	+ 3754248,92	
E1F1	18,26	341 07 10	E1 + 13383,05	+ 3754266,94	
F1G1	50,37	71 07 50	F1 + 13377,14	+ 3754284,22	
G1H1	28,35	341 08 20	G1 + 13424,80	+ 3754300,51	
H1J1	6,31	71 13 10	H1 + 13415,62	+ 3754327,33	

continue on Sheet 2

The figure ABCDEFGHJKLMNPQRSTUVWXYZA1B1C1D1E1F1G1H1J1K1L1M1
represents 1,0358 hectares

of land, being

ERF 15095 (~~PORTION OF ERF 6846~~) STELLENBOSCH

Situate in the Stellenbosch Municipality
Administrative District of Stellenbosch
Surveyed in May 2004 - July 2006
by me

Province of Western Cape

PLS 0907 M B Straughan Pr Land Surveyor

This diagram is annexed to
No.
Dated
i.f.o.

The original diagram is
No.
Annexed to

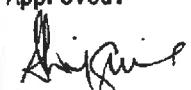
File No. Stel.1055 (V5)
S.R. No. E1763/2006
Comp. BHSZ-1243 (6935)

Registrar of Deeds

LPI C0670022

Erf 15095 Stellenbosch

This diagram represents closed public place

SIDES Metres		ANGLES OF DIRECTION	CO-ORDINATES System WG 19°			S.G. No.
			Y		X	
		Constants :	0,00		0,00	4719/2006
J1K1	28,33	161 07 50	J1 +	13421,59	+ 3754329,36	Approved.
K1L1	34,64	71 07 40	K1 +	13430,75	+ 3754302,55	
L1M1	22,24	26 08 20	L1 +	13463,53	+ 3754313,76	for
M1A	59,43	161 29 50	M1 +	13473,33	+ 3754333,73	Surveyor - General
						Date : 2006-08-01
	142	STEL 9	△ +	8616,92	+ 3748445,46	SHEET 2 OF 3 SHEETS
	405	AARNES	△ +	9183,09	+ 3760305,20	

Beacon Descriptions

U Iron standard section
 W H1 12mm Iron peg in tar
 Y A1 K1 Hole in kerb
 B1 J1 Hole in concrete
 C1 Mark on roof
 All other beacons 12mm Iron peg

ERF 15095 (~~PORTION OF ERF 6846~~) STELLENBOSCH

Administrative District of Stellenbosch

Surveyed in May 2004 - July 2006

by me



PLS 0907 M B Straughan Pr Land Surveyor

Erf 15095 Stellenbosch

ERF 15095 (PTN. OF ERF 6846) STELLENBOSCH

Administrative District of Stellenbosch

S.G. No.

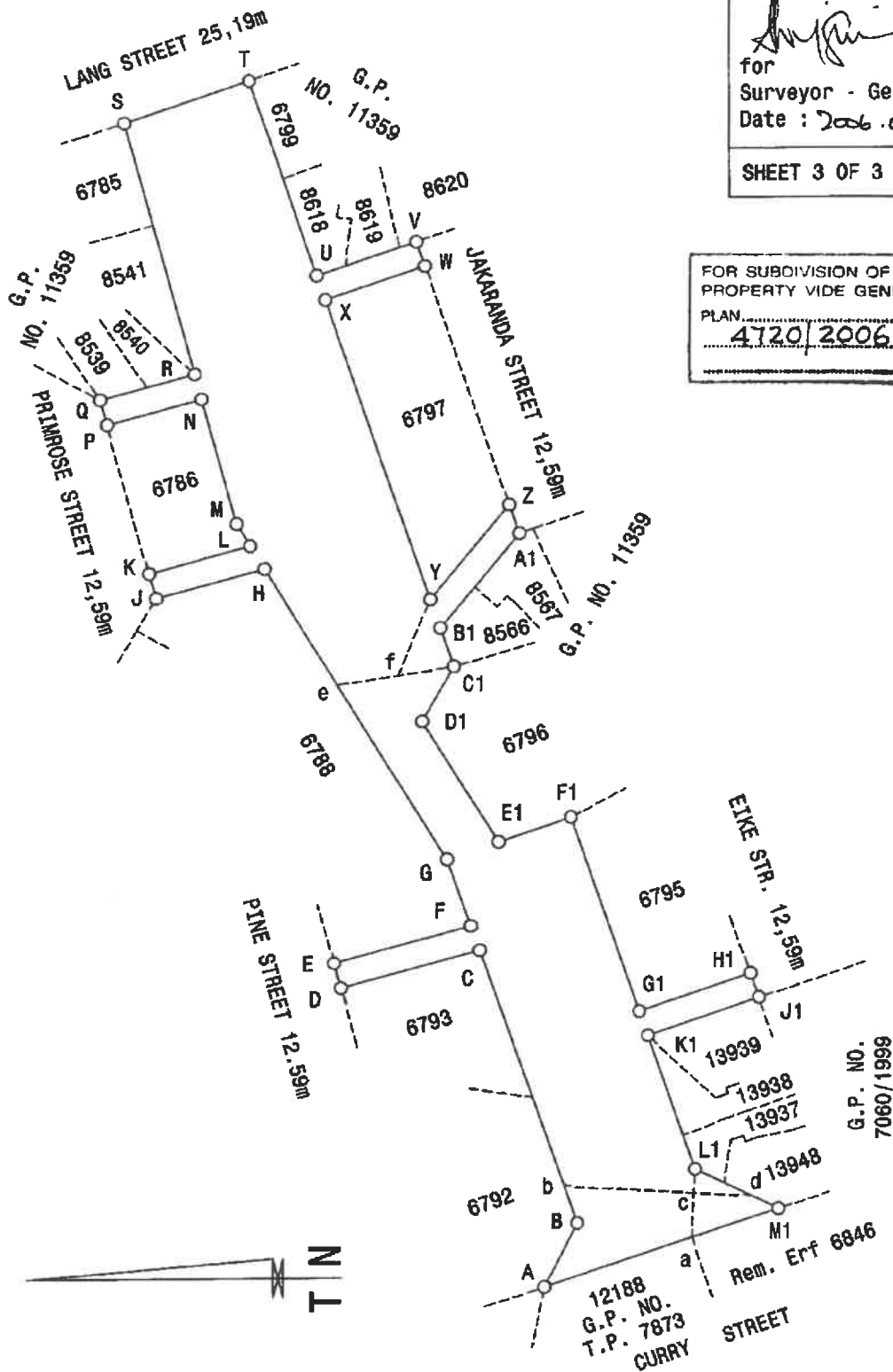
4719/2006

Approved.

[Signature]
for
Surveyor - General
Date : 2006.08.01

SHEET 3 OF 3 SHEETS

FOR SUBDIVISION OF THIS
PROPERTY VIDE GENERAL
PLAN
4720/2006



SCALE 1 : 1500

Surveyed in May 2004 - July 2006
by me *[Signature]*

PLS 0907 M B Straughan Pr Land Surveyor

Erf 15095 Stellenbosch

[illegible]

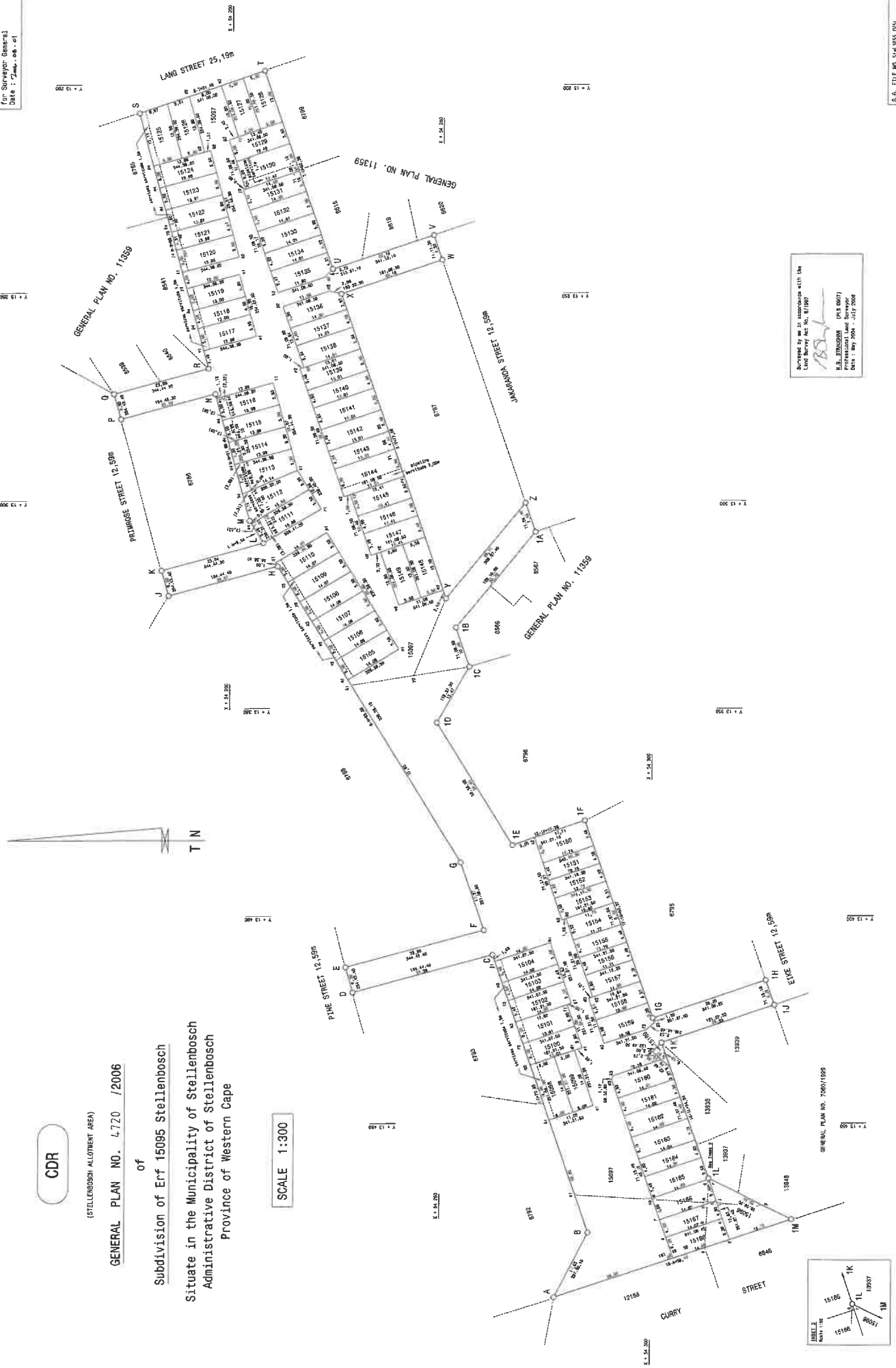
(STELLENBOSCH ALLOTMENT AREA)

of

Subdivision of Erf 15095 Stellenbosch

Situate in the Municipality of Stellenbosch
Administrative District of Stellenbosch
Province of Western Cape

SCALE 1:300



ANNEXURE F:

Motivational report Erf 14599, Stellenbosch

**UNREGISTERD ERF 14599, STELLENBOSCH
ORLEAN LOUNGE**

APPLICATION FOR
SUBDIVISION

March 2024

Submitted by:

Lize Malan

PO Box 3421, Matieland, 7602

lize@lizemalan.co.za

083 440 0953

CONTENTS

1. INTRODUCTION.....	1
1.1 Appointment.....	1
1.2 Background.....	1
1.3 Summary of Application	1
1.3.1 Subdivision of Unregistered Erf 14599, Stellenbosch in terms of Section 15(2)(d) of the SMBMLUP: A subdivision of land that is not exempted in terms of section 24, including the registration of a servitude or lease agreement.	1
2. APPLICATION CONTEXT	1
2.1 Locality	1
2.2 Property Details	5
2.3 Title Deed Conditions and Existing Servitudes	9
2.4 Zoning	9
2.5 Existing and Surrounding Land Use.....	10
2.6 Existing Engineering Services.....	12
2.7 Previous Approvals	14
2.7.1 Subdivision approval	14
2.7.2 Closure of public places and streets	14
2.7.3 Rezoning and departures	14
3. PROPOSAL	15
4. LEGISLATIVE AND POLICY CONTEXT.....	17
4.1 National Environmental Management Act (No. 107 of 1998) (NEMA)	17
4.2 National Heritage Resources Act (No. 25 of 1999) (NHRA)	17
4.3 Spatial Planning and Land Use Management Act (No. 16 of 2013) (SPLUMA)	17
4.4 Western Cape Land Use Planning Act (No. 3 of 2014) LUPA	17
4.4.1 Provincial comment or approval	17
4.4.2 Criteria for evaluation of applications	17
4.5 Stellenbosch Municipality: By-law on Municipal Land Use Planning (2023) SMBMLUP ..	18
5. MOTIVATION	19
5.1 Desirability	19
5.1.1 Socio-economic impact	19
5.1.2 Compatibility with surrounding uses	19
5.1.3 Impact on external engineering services	19
5.1.4 Impact on safety, health and wellbeing of the surrounding community	19
5.1.5 Impact on heritage	19
5.1.6 Impact on bio-physical environment	20
5.1.7 Traffic impacts, parking, access and other transport related considerations	20
5.1.8 Conditions that can mitigate adverse impacts	20
5.2 Comments in response to advertising & applicants response.....	20
5.3 Investigations carried out in terms of other laws	20
5.4 Assessment by registered planner appointed by Municipality	20
5.5 Impact on municipal engineering services	20

5.6 Stellenbosch Municipality Integrated Development Plan (IDP) and Spatial Development Framework (SDF)	20
5.7 District SDF	21
5.8 Local SDFs.....	21
5.9 Structure Plans.....	21
5.10 Municipal policies	21
5.11 Provincial SDF	21
5.12 Regional SDF	21
5.13 National and Provincial policies, principles, planning and development norms and criteria	22
5.14 Principles referred to in Chapter VI of the Land Use Planning Act;	22
5.14.1 Spatial justice	22
5.14.2 Spatial sustainability	22
5.14.3 Efficiency principle	22
5.14.4 Spatial Resilience Principle	22
5.14.5 Good Administration Principle	23
5.15 Provisions of the zoning scheme	23
5.16 Any restrictive condition.....	23
5.17 Impact on any heritage resources.....	23
6. CONCLUSION.....	23

FIGURES

Figure 2.1	:	Location of unregistered Erf 14599, Stellenbosch
Figure 2.2	:	Aerial photograph illustrating unregistered Erf 14599, Stellenbosch in its context
Figure 2.3	:	Unregistered Erf 14599, Stellenbosch in its local context
Figure 2.4	:	Unregistered Erf 14599, Stellenbosch close-up aerial photograph
Figure 2.5	:	Sheet 2 of SG Diagram 4716/2006 for Unregistered Erf 14599, Stellenbosch
Figure 2.6	:	Sheet 2 of SG Diagram 9620/1967 – General Plan for Cloetesville Dorp
Figure 2.7	:	SG Diagram 9149/1986 –Erf 6852, Stellenbosch
Figure 2.8	:	SG Diagram 9148/1986 of Erf 6851, Stellenbosch
Figure 2.9	:	SG Diagram 9155/1986 of Erf 8937, Stellenbosch
Figure 2.10	:	Future services servitudes to be registered (Source: Cape Farm Mapper)
Figure 2.11	:	Zoning of property and surrounds
Figure 2.12	:	Municipal sewage disposal network
Figure 2.13	:	Municipal water reticulation network
Figure 2.14	:	Municipal electrical supply network
Figure 3.1	:	Drone survey of property
Figure 5.1	:	Stellenbosch SDF 2019: Extract from Figure 28 Spatial plan for Stellenbosch

LIST OF APPLICATION DOCUMENTATION SUBMITTED

Attachment 1:	Application form
Attachment 2:	Pre-application scrutiny documentation
Attachment 3:	Motivation report (this document)
Attachment 4:	Subdivision Plan for Unregistered Erf 14599 - General Plan 4717/2006

- Attachment 5: Original approvals
- Attachment 6: Title deed for Erf 6667, Stellenbosch, Remainder Erf 6582, Stellenbosch, Erf 8581, Stellenbosch, Erf 8937, Stellenbosch
- Attachment 7: Power of attorney
- Attachment 8: Conveyancer's certificate
- Attachment 9: SG Diagrams for Erf 6667, Stellenbosch, Remainder Erf 6582, Stellenbosch, Erf 8581, Stellenbosch, Erf 8937, Stellenbosch and unregistered Erf 15095, Stellenbosch
- Attachment 10: Locality plan

1. INTRODUCTION

1.1 Appointment

Lize Malan has been duly appointed by the Stellenbosch Municipality, owner of Erf 14599, Stellenbosch, to make an application for the subdivision of said property. The application is required as the subdivision, that was approved on 1 July 2005, has lapsed in terms of Section 27(2) of the Land Use Planning Ordinance (Ordinance 15 of 1985), as none of the subdivided erven has been transferred from the owner, the Stellenbosch Municipality to another entity, since the approval (i.e., exceeding the five-year period). This application is funded by Khaya Lam, an NPO, with whom the Municipality has signed a Memorandum of Understanding, which facilitates the transfer of subsidised housing to the intended beneficiaries.

1.2 Background

Erf 14599, Stellenbosch, accommodates a development known as Orlean Lounge. This development dates to 2007/2008 and was an innovative infill housing project, that utilised a public open space that was not optimally used at the time. The subdivision of Erf 14599, Stellenbosch as per General Plan 4717/2006, to accommodate 90 group housing units, and a street portion was approved in 2005. This project was undertaken in parallel with The Steps, a similar housing project in Cloetesville, that is the subject of a similar reapplication process. The housing units were constructed in 2007/2008, but as noted none of the units was transferred to intended beneficiaries. The reason for this is unclear.

1.3 Summary of Application

The following application is made in terms of the Stellenbosch Municipality: By-law on Municipal Land Use Planning of 2023 (SMBMLUP).

1.3.1 Subdivision of unregistered Erf 14599, Stellenbosch in terms of Section 15(2)(d) of the SMBMLUP: A subdivision of land that is not exempted in terms of section 24, including the registration of a servitude or lease agreement.

2. APPLICATION CONTEXT

2.1 Locality

Unregistered Erf 14599, Stellenbosch is known as Orlean Lounge in Cloetesville. Figure 2.1 illustrates the location of the property in the context of Stellenbosch and Figures 2.2 and 2.3 provide aerial photographs which illustrate the property in its context and existing development on site. The property is bounded by North End Street to the South and Vredelust Street to the west. Daffodil Crescent runs through the complex and provides access to the erven. A theatre complex is located in the middle of the property on its own erf.

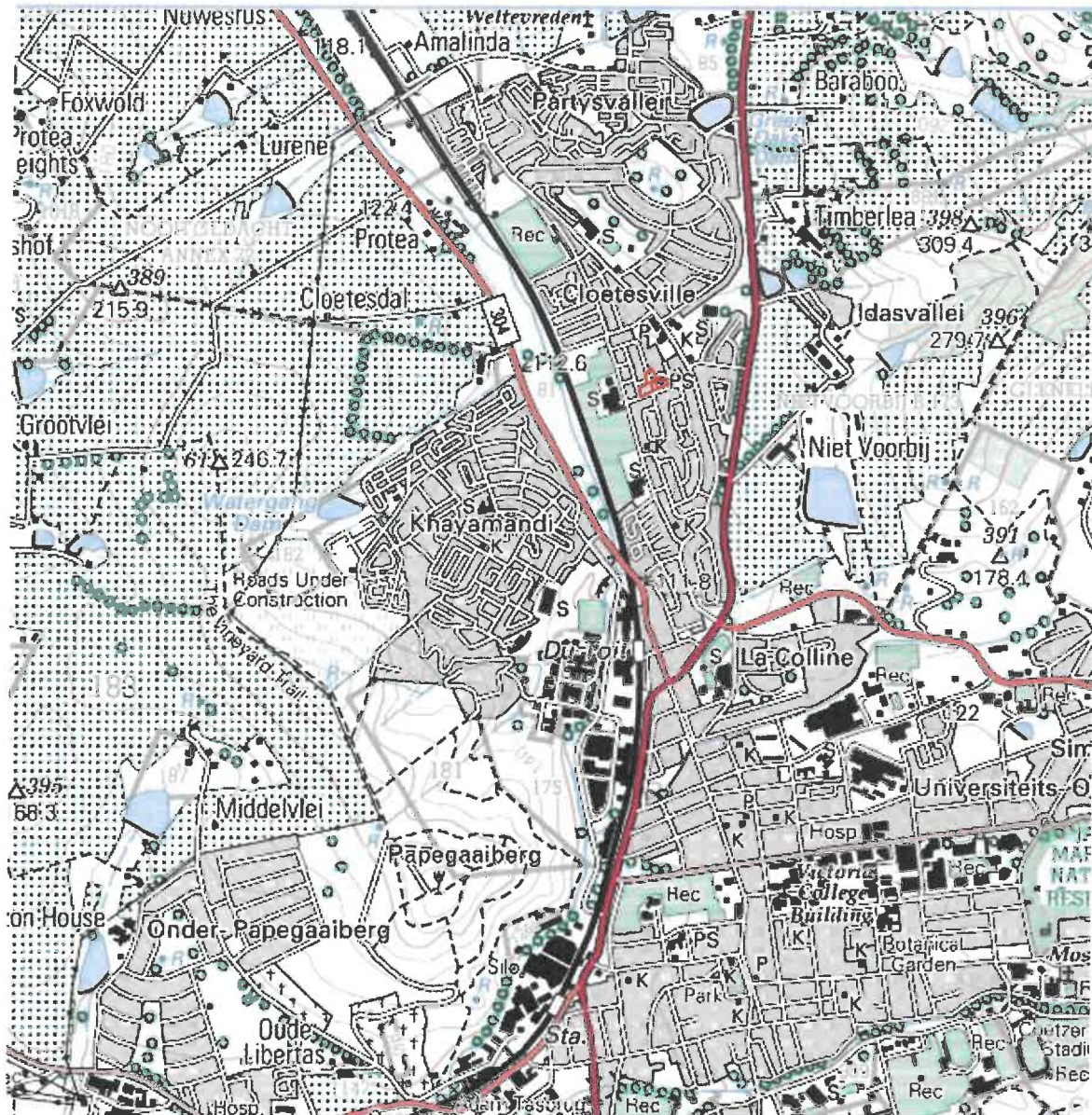


Figure 2.1 Location of unregistered Erf 14599, Stellenbosch (Source: Extract from 1:50 000 Topographical map 3318DD Stellenbosch, 2010, National Geo-spatial Information)



Figure 2.2: Aerial photograph illustrating unregistered Erf 14599, Stellenbosch in its context
 (Source: <https://gis.elsenburg.com/apps/cfm/>)



Figure 2.3: Aerial photograph illustrating unregistered Erf 14599, Stellenbosch in its local context
 (Source: <https://gis.elsenburg.com/apps/cfm/>)

SUBDIVISION APPLICATION: Unregistered Erf 14599, Stellenbosch



Figure 2.4: Unregistered Erf 14599, Stellenbosch close-up aerial photograph (Source: <https://gis.elsenburg.com/apps/cfm/>)

2.2 Property Details

Table 2.1 provides a summary of the subject property details:

Erf No.	Unregistered Erf 14599, Stellenbosch
Underlying erven	Erf 6667, Stellenbosch Remainder Erf 6582, Stellenbosch Portion of Erf 6581, Stellenbosch Portion of Erf 8937, Stellenbosch
Owner	Stellenbosch Municipality
Total Extent	1,1164 ha
Title Deed No.:	T13078/1978 T30472/1987 T30474/1987 T30476/1987
Title Deed Restrictions	None
SG Diagram No.	Unregistered Erf 14599: 4716/2006 Erf 6667, Stellenbosch: 9620/1967 Remainder Erf 6582, Stellenbosch: 9149/1986 Portion of Erf 6581, Stellenbosch: 9148/1986 Portion of Erf 8937, Stellenbosch: 9155/1986
Servitudes	Yes: services, stormwater
Current Zoning	Conventional Residential
Current Land Use	Residential
Applicable Zoning Scheme	Stellenbosch Municipal Zoning Scheme By-law (2019)
Overlay Zones:	None
Metropolitan/Provincial Rd:	No
Property affected by Road widening:	No
National Heritage Resources Act	No
NEMA Regulations Applicable	No
Comply with Policy/Structure Plans	Yes



This erf consists of:

- Erf 6667, Stellenbosch

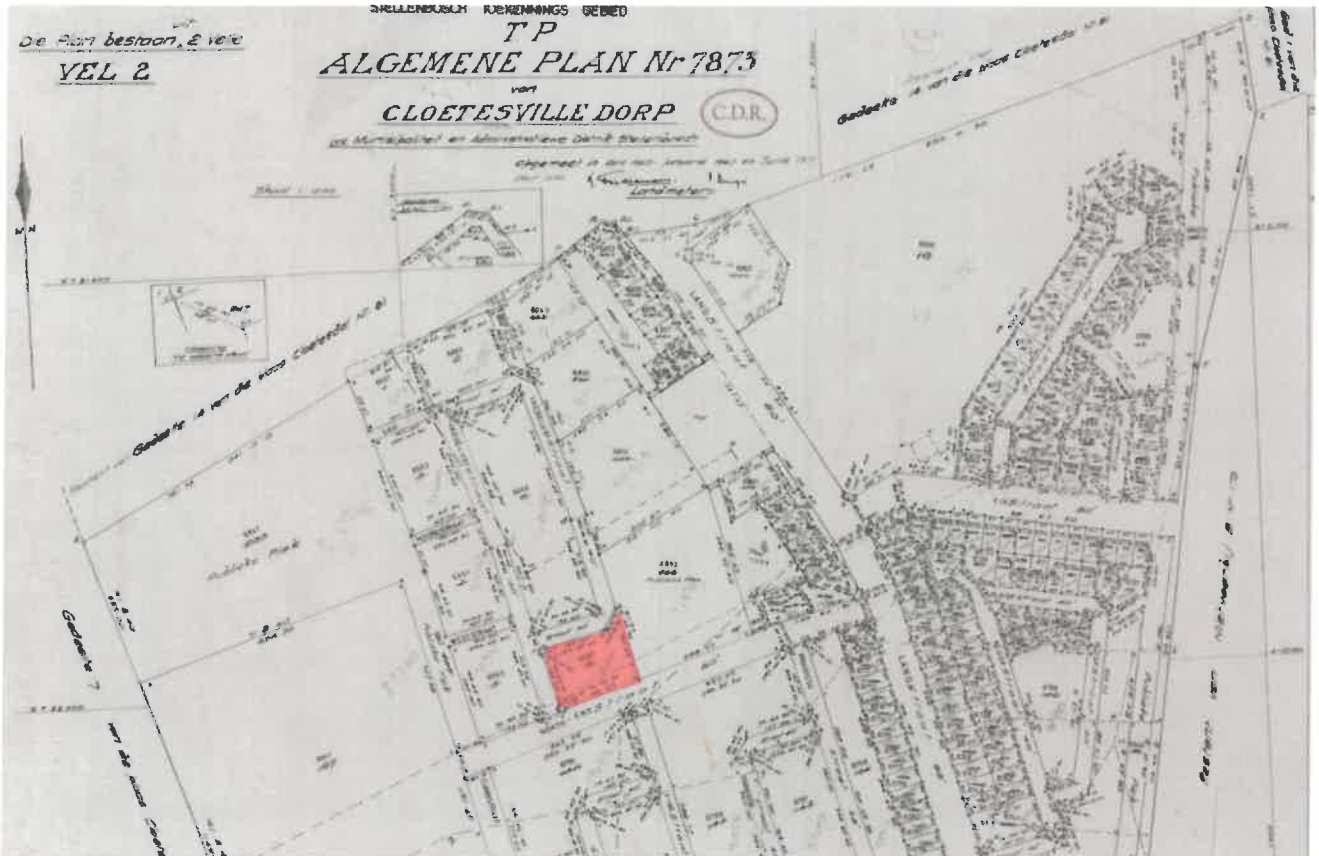


Figure 2.6: Sheet 2 of SG Diagram 9620/1967 – General Plan for Cloeteville Dorp. Location of Erf 667 highlighted

- Remainder Erf 6852, Stellenbosch

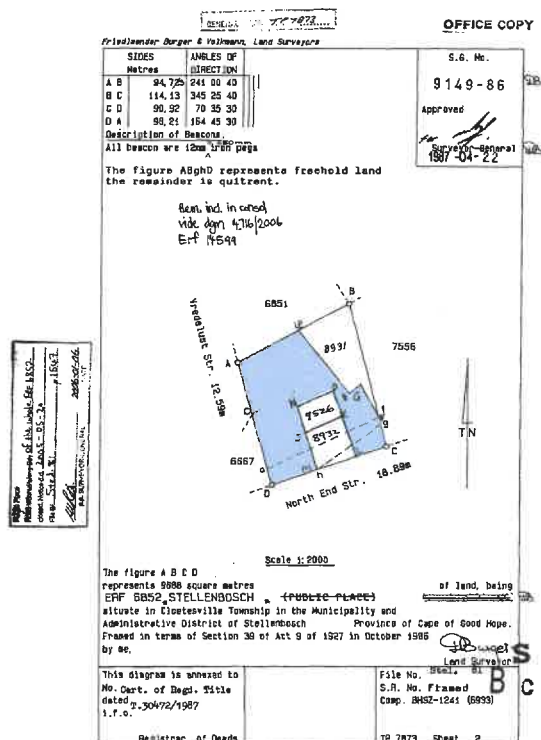


Figure 2.7: SG Diagram 9149/1986 – Remainder of Erf 6852 highlighted

- Unregistered Erf 14597 – A portion of Erf 6851, Stellenbosch

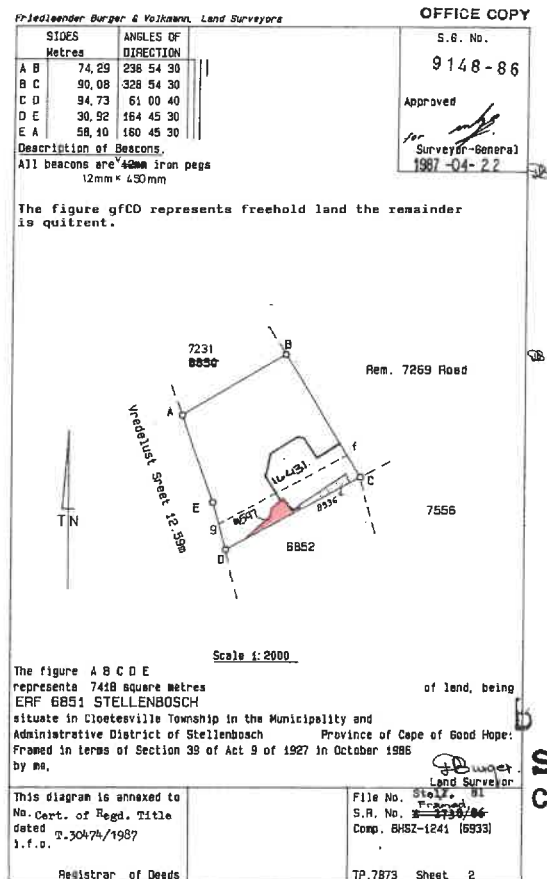


Figure 2.8: SG Diagram 9148/1986 of Erf 6851 – Unregistered Erf 14597 highlighted

- Unregistered Erf 14598 – a portion of Erf 8937, Stellenbosch

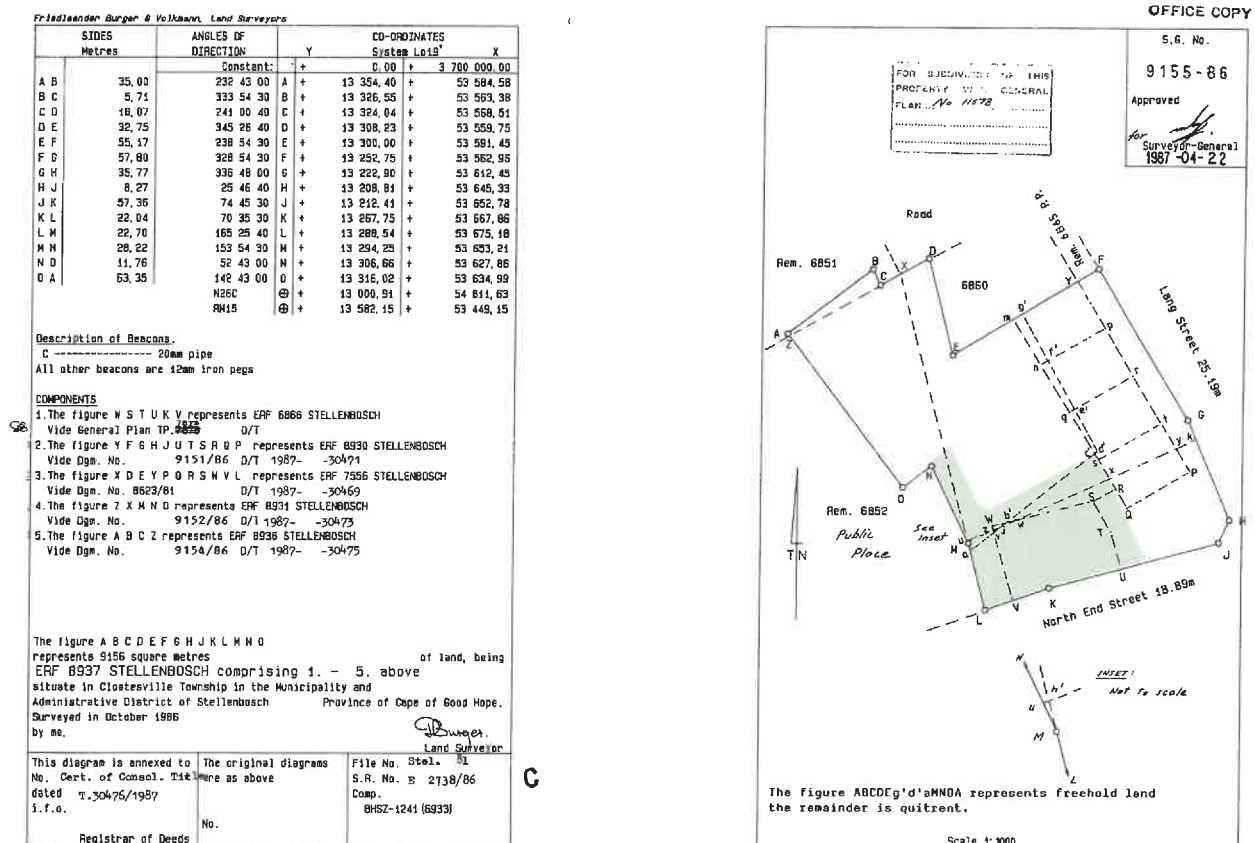


Figure 2.9: SG Diagram 9155/1986 of Erf 8937 – Unregistered Erf 14598 highlighted

There are no restrictions title deed conditions of relevance to this application. Please also refer to the conveyancer's certificate that is included in this submission.

This is an aerial map of a residential neighborhood. The map shows several streets: Curry Street, Noord Street, Vredelust Street, West Street, North End Street, and Lang Street. House numbers are visible on many of the lots. A red outline highlights a specific area, and a yellow highlight is on a street segment.

2.4 Zoning

Zoning Scheme 2018

- Conventional Residential Zone
- Less Formal Residential Zone
- Multi-unit Residential Zone
- Community Zone
- Education Zone
- Industrial Zone
- Limited Use Zone
- Local Business Zone
- Mixed Use Zone
- Agriculture and Rural Zone
- Private Open Space Zone
- Public Open Space Zone
- Public Roads and Parking Zone
- Subdivisional Area
- Transport Facility Zone
- Utility Service Zone
- Natural Environment Zone
- Split Zone

(Colour of the rectangle corresponds with zoning of the split zone)

March 2024

2.5 Existing and Surrounding Land Use

The erven which constitute Erf 14599 accommodate attached duplex units in groups of two, three and four with two groupings of two units each that are barely attached. The site is located within the larger residential area of Cloetesville. The development is largely surrounded by older row housing and free-standing houses. The Breughel Theatre is located in the middle of the development on its own erf. The land to the north of the site accommodates the Cloetesville library and community hall.



Photograph 1: The development as seen from the eastern end of North End Street (August 2023)



Photograph 2: The development from Vredelust Street to the north of the site (August 2023)



Photograph 3: The development as seen from the internal street that curves through the site (looking west) (Google Streetview, March 2023)



Photograph 4: The development as seen from the internal street that curves through the site (looking east) with the Breughel Theatre visible to the right in the middle distance (Google Streetview, March 2023)



Photograph 5: The development as seen from Daffodil Street looking south (Google Streetview, March 2023)



Photograph 6: The northern edge of the development as seen from Vredelust Street looking south (Google Streetview, March 2023)

2.6 Existing Engineering Services

The individual units that constitute the site in question are serviced by the Municipal water, sewage and electricity reticulation networks.

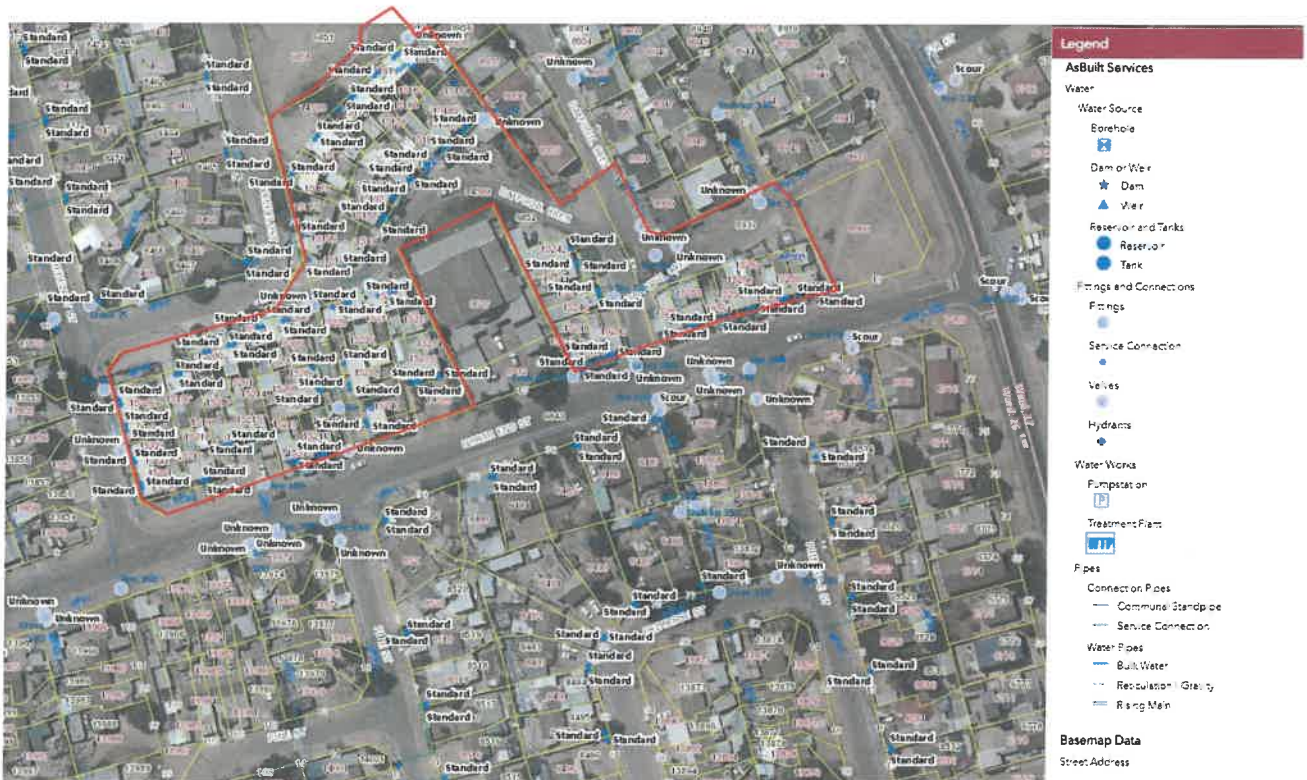


Figure 2.12: Screenshot from Municipal database illustrating the water network and connections for Unregistered Erf 14599, Stellenbosch



Figure 2.13: Screenshot from Municipal database illustrating the sewage disposal network and connections for Unregistered Erf 14599, Stellenbosch



Figure 2.14: Screenshot from Municipal database illustrating the electrical network and connections for Unregistered Erf 14599, Stellenbosch

2.7 Previous Approvals

2.7.1 Subdivision approval

On 1 July 2005, the Stellenbosch Municipality issued a letter of approval for the subdivision of (unregistered) Erven 14599 and 15095, Stellenbosch – i.e. the application for Orlean Lounge and The Steps. The approval letter is submitted with this application as a separate electronic document.

The conditions of approval of the subdivision were as follows:

- The approved General Plans must be submitted to the office for record and final registration purposes;
- The requirements as stated in regulations 3.5 and 3.6 of the Scheme Regulations which have been promulgated in terms of Section 7(2) of the Ordinance 15 of 1985 (PN 1047/1988) must be complied with¹; and
- Services must be provided to the subdivision in accordance with Regulation 39 of the regulations promulgated in terms of Section 47(1) of Ordinance 15 of 1985. (In this regard your attention is invited to the Provincial Administration Circulars LG/PB 15/1986 dated 1986-06-20 and LG/PB 17/1986 dated 1986-07-09.

2.7.2 Closure of public places and streets

Prior to the subdivision approval, the closure of the Erf 6852, Stellenbosch as a public place as well as certain of portions of public streets, that was incorporated into the development, was approved and gazetted in terms of Section 137(1) of Ordinance 20 of 1974 (Gazette Notice 62, 29 April 2004).

2.7.3 Rezoning and departures

On 1 December 2008, after the project was constructed, the Stellenbosch Municipality approved the rezoning of Erf 14599 from Specific Business, Local Authority and Public Open Space to Subdivisional Area to allocate the zoning of Group Housing to 90 unregistered portions of Erf 14599 (Erven 15172 to 15261) and a zoning of Local Authority (Street purposes) to the Remainder Road as per General Plan 4717/2006.

In addition, the following departures were approved in order to relax the following requirements:

- The street building line to 1m and the common building lines to 0m, provided that where a building is erected less than 1m from a side boundary no windows and doors shall be permitted in the wall concerned, provided further that if a midblock sewage system is provided, the Council may require a rear building line of up to 2m.
- The minimum common open space of 40m² per dwelling to 0m.
- The two required parking bays for a dwelling to none.
- The density requirements, in order to increase it to 80 dwelling units per gross hectare.
- The requirement to provide service yard and private outdoor space, in order not to provide any.

The only conditions of approval stated that the approval applies only to the rezoning and departure in question, as indicated on Appendix 3 and Appendix 4 and shall not be construed

¹ These sections refer to provision of services across the erven created and permitting construction on a land unit of subdivision that has not been confirmed respectively.

as authority to depart from any other legal prescriptions or requirements; and the Council reserves the right to impose further conditions if needed. Appendix 3 and 4 included copies of the General Plans and SDPs.

3. PROPOSAL

This application simply entails a re-application for the subdivision of Unregistered Erf 14599, Stellenbosch as per General Plan 4717/2006, that was approved in 2005. This plan is included in this submission.

It is acknowledged that since the units have been constructed and occupied, numerous extensions were added to the properties, many of which encroach on both building lines as well as the proposed erf boundaries, despite the departures granted. The current footprint of structures on the site was surveyed through high resolution drone footage in August 2023 and the approved General Plan was superimposed on the aerial photograph and accurately geo-referenced to provide a clear picture of the extent of encroachments². The diagram overleaf illustrates the results of the drone survey.

In discussion with the Municipality, it was agreed, that these encroachments cannot simply be condoned in a blanket fashion, especially the encroachments into the future road reserves, through either departure applications and/or a re-subdivision. On the other hand, as the properties currently in effect belong to the Municipality, the occupants/future beneficiaries cannot at this stage make any application to regularise the situation.

It was thus agreed that an application should be made for the previously approved plans, with a recommendation that as a condition of approval, all beneficiaries who have extended the original built footprint on their property, should apply to the Municipality to have the building plans for the extensions approved, once the properties have been transferred in their name, or risk prosecution by the Municipality. This aspect must be clearly communicated to beneficiaries at the time that the Municipality engage with beneficiaries to prepare the necessary transfer documents.

² It is of course acknowledged that since the survey, the situation on the ground could have changed.

4. LEGISLATIVE AND POLICY CONTEXT**4.1 National Environmental Management Act (No. 107 of 1998) (NEMA)**

As the subject property fall inside the urban area of Stellenbosch and the houses are already constructed, the provisions of NEMA are not applicable to this application.

4.2 National Heritage Resources Act (No. 25 of 1999) (NHRA)

The proposed development does not trigger any of the provisions of Section 38 of NHRA, nor are any of the buildings on the site older than 60 years, i.e. Section 34 is also not applicable. No other provisions of the NHRA are applicable.

4.3 Spatial Planning and Land Use Management Act (No. 16 of 2013) (SPLUMA)

The Spatial Planning and Land Use Management Act (No. 16 of 2013) (SPLUMA) is the overarching planning legislation enacted on 1 July 2015 which provides the legal framework for laws adopted at provincial and local government levels. It repealed a number of previous acts and contains overall planning and development principles which must guide all land development in the country. These principles are:

- i) Principle of spatial justice
- ii) Principle of spatial sustainability
- iii) Principle of efficiency
- iv) Principle of spatial resilience
- v) Principle of good administration

4.4 Western Cape Land Use Planning Act (No. 3 of 2014) LUPA

At the same time as SPLUMA, the Western Cape Government's Land Use Planning Act (No. 3 of 2014) (LUPA) came into operation and it has been enacted in the Stellenbosch Municipality. In terms of this legislation, the Municipality shall decide on the applications related to this proposal.

4.4.1 Provincial comment or approval

Section 45 of LUPA, requires Provincial comment on applications which are outside the urban limits of a municipality; where agricultural land or conservation land is rezoned; where development affects a provincial function; or any application which falls in a category identified by Province as supporting/strengthening a municipality. This application does not fall in any of these categories.

4.4.2 Criteria for evaluation of applications

Section 19 of the Land Use Planning Act, no 3 of 2014 requires that applications be either compliant or consistent with a spatial development framework.

In terms of Section 49 of LUPA, when considering a land use application, a municipality must have regard for at least the following:

- i) The applicable spatial development frameworks;
- ii) The applicable structure plans;
- iii) The principles referred to in Chapter VI (Section 59):
 - a. Spatial Justice
 - b. Spatial Sustainability
 - c. Efficiency
 - d. Good Administration
 - e. Spatial Resilience

- iv) The desirability of the proposed land use; and
- v) Guidelines that may be issued by the Provincial Minister regarding the desirability of proposed land use.

4.5 Stellenbosch Municipality: By-law on Municipal Land Use Planning (2023) SMBMLUP

The SMBMLUP specifies the application process which must be followed for an application to the Municipality as well as the criteria for decision making which are set out in Section 65 of the by-law. With regard to this application, Section 65 stipulates the municipality must have regard to the following:

- (a) the application submitted in terms of this By-law;
- (b) the procedure followed in processing the application;
- (c) the desirability of the proposed utilisation of land and any guidelines issued by the Provincial Minister regarding the desirability of proposed land uses and which relevant desirability considerations for the assessment of the proposed use or development of land includes the -
 - (i) socio-economic impact;
 - (ii) compatibility with surrounding uses;
 - (iii) impact on the external engineering services;
 - (iv) impact on safety, health and wellbeing of the surrounding community;
 - (v) impact on heritage;
 - (vi) impact on the biophysical environment;
 - (vii) traffic impacts, parking, access and other transport related considerations; and
 - (viii) whether the imposition of conditions can mitigate an adverse impact of the proposed use or development of land.
- (d) the comments in response to the notice of the application, including comments received from organs of state, municipal departments and the Provincial Minister in terms of section 45 of the Land Use Planning Act;
- (e) the response by the applicant, if any, to the comments referred to in paragraph (d);
- (f) investigations carried out in terms of other laws that are relevant to the consideration of the application;
- (g) a written assessment by a registered planner appointed by the Municipality in respect of an application for—
 - (i) a rezoning;
 - (ii) a subdivision of more than 20 cadastral units;
 - (iii) a removal, suspension or amendment of a restrictive condition if it relates to a change of land use;
 - (iv) an amendment, deletion or imposition of additional conditions in respect of an existing use right;
 - (v) an approval of an overlay zone contemplated in the zoning scheme;
 - (vi) a phasing, amendment or cancellation of a subdivision plan or part thereof;
 - (vii) a closure of a public place or part thereof;
- (h) the impact of the proposed land development on municipal engineering services;
- (i) the integrated development plan, including the municipal spatial development framework;
- (j) the integrated development plan of the district municipality, including its spatial development framework, where applicable;
- (k) the applicable local spatial development frameworks adopted by the Municipality;

- (l) the applicable structure plans;
- (m) the applicable policies of the Municipality that guide decision making;
- (n) the provincial spatial development framework;
- (o) where applicable, a regional spatial development framework contemplated in section 18 of the Spatial Planning and Land Use Management Act and provincial regional spatial development framework;
- (p) the policies, principles and the planning and development norms and criteria set by the national and provincial government;
- (q) the matters referred to in section 42 of the Spatial Planning and Land Use Management Act;
- (r) the principles referred to in Chapter VI of the Land Use Planning Act;
- (s) the applicable provisions of the zoning scheme;
- (t) any restrictive condition applicable to the land concerned; and
- (u) the impact of the proposed land development on any heritage resources as defined in the National Heritage Resources Act, 1999 (Act 25 of 1999)

5. MOTIVATION

The various levels of planning legislation (SPLUMA, LUPA and the Municipal Land Use Planning By-Law) require that a variety of principles and assessment criteria be applied when assessing development applications. This chapter aims to motivate the proposal at the hand of these various principles and criteria. The motivation is set out according to the criteria for assessment in Section 65 of the Stellenbosch Municipality: By-law on Municipal Land Use Planning (2023).

5.1 Desirability

5.1.1 Socio-economic impact

The proposed sub-division is aimed at facilitating the transfer of the individual properties to the identified and vetted beneficiaries. This will result in empowerment of these households as homeowners – resulting in security of tenure and owning an asset that can provide accommodation and financial security for current and subsequent generations. The property could also serve as collateral for loans in support of education, etc. At its heart, the purpose of this application is to create a positive socio-economic impact.

5.1.2 Compatibility with surrounding uses

As the duplex units are already constructed and occupied, and forms part of a larger residential area, it is evident that the land use is compatible with the surrounding uses. It is noted that the surrounding houses, are already in private ownership. The subdivision and transfer for these properties will thus tie in with the area.

5.1.3 Impact on external engineering services

The individual properties are all serviced by the municipality already and so will have no impact on external engineering services.

5.1.4 Impact on safety, health and wellbeing of the surrounding community

As the duplex units were constructed in 2007/2008 already (and the development is integrated into the local area), the proposal will have no impact on the existing security, health and wellbeing conditions of the community.

5.1.5 Impact on heritage

The proposal will not impact on any heritage resources. In this regard it is noted that the development dates to 2007/2008.

5.1.6 Impact on bio-physical environment

The development is already constructed, and the proposed subdivision will have no impact on the bio-physical environment.

5.1.7 Traffic impacts, parking, access and other transport related considerations

As the development is already constructed, the impacts on traffic, parking, access and transport have already manifested. It is noted that many of the individual units have been extended, with encroachments into the future road reserve. This situation is not unique to this development – it is commonplace throughout the Municipality. However, it cannot be condoned and thus it is suggested that as a condition of approval of the subdivision application, all beneficiaries will be required to submit building plans to the Municipality for approval of the extensions/additions to regularise encroachments of building lines and erf boundaries.

5.1.8 Conditions that can mitigate adverse impacts

As proposed in Section 5.1.7 above, it is proposed that as a condition of approval, all beneficiaries are required to submit building plans to the Municipality, once they have taken transfer of the properties, to regularise encroachments of building lines and erf boundaries, or risk prosecution.

5.2 Comments in response to advertising & applicants response

It is the intention to apply for an exemption from the provisions of Sections 45 and 47 of LUPA, to the Western Cape Provincial Government. Should this be successful this requirement will not be applicable to the application.

5.3 Investigations carried out in terms of other laws

No investigations in terms of other legislation were required for this application.

5.4 Assessment by registered planner appointed by Municipality

To be undertaken by Municipality.

5.5 Impact on municipal engineering services

As the development is already serviced by Municipal service networks, the subdivision will not result in any impact on engineering services.

5.6 Stellenbosch Municipality Integrated Development Plan (IDP) and Spatial Development Framework (SDF)

Section 19 of the Land Use Planning Act (No. 3 of 2014) requires that applications be either compliant or consistent with a Spatial Development Framework (SDF). Consistency is achieved when the proposal is not specifically provided for in the plan, but the proposal is also not in conflict with the plan. As the development is already constructed, it is in fact reflected as existing urban development. The proposal is thus consistent with the SDF.

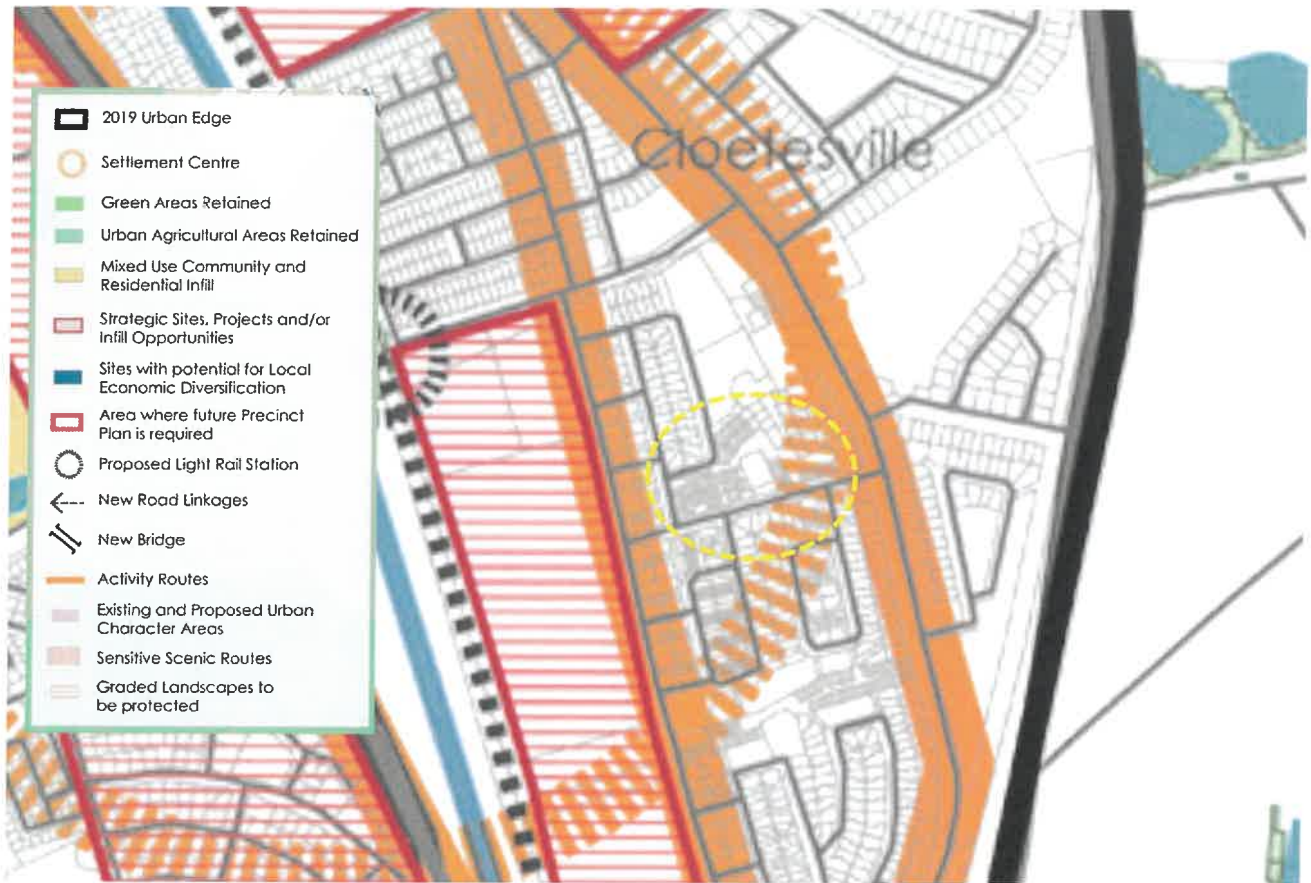


Figure 5.1: Extract from Figure 28 Stellenbosch Town Plan from the Stellenbosch Municipality Spatial Development Framework as adopted by Council, November 2019. The location of unregistered Erf 14599, Stellenbosch is indicated with a yellow dashed circle.

5.7 District SDF

The Cape Winelands District SDF (2021-2026) does not provide sufficient detail to have a bearing on this application.

5.8 Local SDFs

There is no local SDF for this area of Stellenbosch.

5.9 Structure Plans

There are no structure plans applicable to the property.

5.10 Municipal policies

There are no Municipal policies relevant to this application.

5.11 Provincial SDF

The Western Cape Provincial Spatial Development Framework, 2014 (PSDF) was prepared in terms of Section 13 of SPLUMA and Section 4 of LUPA, with inter alia the aim to coordinate, integrate and align the plans, policies and development strategies of municipalities (PSDF, 2014: 12). As such the PSDF was prepared at a higher level which does not provide specific guidance for the land use management of individual/specific properties and has no direct relevance to this application.

5.12 Regional SDF

There are no regional SDFs applicable to the site, except for the District SDF referred to above.

5.13 National and Provincial policies, principles, planning and development norms and criteria

There are no other specific policies, norms and criteria set by the National and Provincial Government that have direct bearing on this application, other than the guiding principles of SPLUMA and LUPA, which are discussed in Section 5.14 below.

5.14 Principles referred to in Chapter VI of the Land Use Planning Act;

5.14.1 Spatial justice

The spatial justice principle requires that past spatial and development imbalances be redressed through improved access to and utilisation of land. It requires that persons which were previously excluded (especially the poor) must be included in land use planning policies, especially in order to address widespread poverty and deprivation. Access to land for all (including disadvantaged communities) should be facilitated.³ This project whilst not providing "new" access to land, will result in security of tenure, which is in line with this principle.

5.14.2 Spatial sustainability

The principle of spatial sustainability will be achieved by a development when a development is spatially compact, resource frugal and within the means of the municipality. It must protect prime agricultural land and must take into consideration all other environmental issues. It must stimulate the land market and must consider all the costs of infrastructure (future and current) as well as the provision of social services. It must aim to limit urban sprawl, result in viable communities and strive to meet the basic needs of citizens in an affordable way.⁴ Development must also ensure the sustained protection of the environment (ecological corridors, biodiversity, heritage resources, promote provincial tourism and avoid development of steep slopes, floodplains, wetlands etc.). Energy efficiency should be promoted.⁵

The proposal, by virtue of having been physically implemented already, could be regarded as neutral with respect to this principle.

5.14.3 Efficiency principle

The principle of efficiency requires that development should optimise the use of existing resources, including infrastructure⁶, and requires that integrated cities and towns be developed whereby social, economic and institutional aspects of land development is integrated and residential opportunities are provided close to employment opportunities. A diversity of land uses is to be incorporated and the spatially distorted patterns of the past are to be corrected. Towns should be of sufficient density and urban sprawl must be discouraged.⁷ Similar to 5.14.2, the proposal could be regarded as neutral with respect to this principle.

5.14.4 Spatial Resilience Principle

³ Section 7 (a) of SLUMA and section 59(1) of LUPA

⁴ Section 7(b) of SPLUMA and section 59(2)(a) of LUPA

⁵ Section 59(2)b of LUPA

⁶ Section 7(c) of SPLUMA

⁷ Section 59(3) of LUPA

The principle of spatial resilience requires flexibility in land use management systems and policies to ensure sustainable livelihoods for communities most likely affected by economic and environmental shocks.⁸

This proposal will not necessarily contribute to spatial resilience, but the fact that it will lead to property ownership could contribute to creating more sustainable livelihoods.

5.14.5 Good Administration Principle

The good administration principle requires that the application follows the correct procedures as prescribed in law. The Municipality will have to ensure that the application is complete and correctly processed.

5.15 Provisions of the zoning scheme

This application is for the subdivision of Unregistered Erf 14599, Stellenbosch, in terms of Section 15(2)(d) of the Stellenbosch Municipality: By-law on Municipal Land Use Planning of 2023, only. It is acknowledged that the subdivision will in effect result in many of the individual properties being in contravention of certain provisions of the Stellenbosch Municipality Zoning Scheme, because of additions to the original structures. Such contraventions would include encroachment on building lines and erf boundaries. However, it was agreed with Municipal officials, that this problem can be resolved most effectively once the properties have been transferred. The beneficiaries will then have to take responsibility for these issues. It is thus suggested that informing the beneficiaries of the intended action at the time of signing the contracts to purchase and the serving of notices on the individual owners once the properties are transferred, is set as a condition of approval of this application.

5.16 Any restrictive condition

There are no restrictive title conditions pertaining to this application.

5.17 Impact on any heritage resources

No heritage resources will be impacted by this application.

6. CONCLUSION

The motivation for this application is simply to enable the Municipality to transfer houses to the originally intended beneficiaries of this housing project. Whereas the subsequent additions to the original houses are a complication, it must be borne in mind that this is commonplace throughout the Municipality. Furthermore, the Municipality, as the current landowner, cannot take responsibility for these contraventions of the Zoning Scheme and it is regarded as inappropriate to apply for blanket departures at this stage or amend the general plan. Municipal officials have agreed that it would be fair and efficient to place the responsibility for regularising the situation with the beneficiaries and to consider the contraventions on a case-by-case basis.

Thus, the recommendation is made that this application for subdivision of unregistered Erf 14599, Stellenbosch, as per General Plan 4717/2006, included in this submission, is approved on condition that the Municipality undertakes to:

⁸ Section 7d) of SPLUMA
March 2024

- Inform vetted beneficiaries of their responsibilities in terms of the SMBMLUP and Zoning Scheme at the time that the contracts to purchase the erven thus created are signed.
- Serve notices on the owners, once the transfers have taken place, to make the necessary applications and/or on-site alterations to ensure compliance with the Stellenbosch Zoning Scheme.

ANNEXURE G:

Motivational report Erf 15095, Stellenbosch

REMAINDER ERF 6846, STELLENBOSCH
(UNREGISTERD ERF 15095, STELLENBOSCH)
THE STEPS

APPLICATION FOR
SUBDIVISION

March 2024

Submitted by:

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CONTENTS

1. INTRODUCTION.....	1
1.1 Appointment.....	1
1.2 Background.....	1
1.3 Summary of Application	1
1.3.1 Subdivision of Remainder of Erf 6846, Stellenbosch in terms of Section 15(2)(d) of the SMBMLUP: A subdivision of land that is not exempted in terms of section 24, including the registration of a servitude or lease agreement.	1
2. APPLICATION CONTEXT	2
2.1 Locality	2
2.2 Property Details	5
2.3 Title Deed Conditions and Existing Servitudes	8
2.4 Zoning	8
2.5 Existing and Surrounding Land Use	9
2.6 Existing Engineering Services.....	11
2.7 Previous Approvals	12
2.7.1 Subdivision approval	12
2.7.2 Closure of public places and streets	12
2.7.3 Rezoning and departure approval	12
3. PROPOSAL	13
4. LEGISLATIVE AND POLICY CONTEXT.....	17
4.1 National Environmental Management Act (No. 107 of 1998) (NEMA)	17
4.2 National Heritage Resources Act (No. 25 of 1999) (NHRA)	17
4.3 Spatial Planning and Land Use Management Act (No. 16 of 2013) (SPLUMA)	17
4.4 Western Cape Land Use Planning Act (No. 3 of 2014) LUPA	17
4.4.1 Provincial comment or approval	17
4.4.2 Criteria for evaluation of applications	17
4.5 Stellenbosch Municipality: By-law on Municipal Land Use Planning (2023) SMBMLUP ..	18
5. MOTIVATION	19
5.1 Desirability	19
5.1.1 Socio-economic impact	19
5.1.2 Compatibility with surrounding uses	19
5.1.3 Impact on external engineering services	19
5.1.4 Impact on safety, health and wellbeing of the surrounding community	19
5.1.5 Impact on heritage	19
5.1.6 Impact on bio-physical environment	20
5.1.7 Traffic impacts, parking, access and other transport related considerations	20
5.1.8 Conditions that can mitigate adverse impacts	20
5.2 Comments in response to advertising & applicants response	20
5.3 Investigations carried out in terms of other laws	20
5.4 Assessment by registered planner appointed by Municipality	20
5.5 Impact on municipal engineering services	20

5.6 Stellenbosch Municipality Integrated Development Plan (IDP) and Spatial Development Framework (SDF)	20
5.7 District SDF	21
5.8 Local SDFs.....	21
5.9 Structure Plans.....	21
5.10 Municipal policies	21
5.11 Provincial SDF	21
5.12 Regional SDF	21
5.13 National and Provincial policies, principles, planning and development norms and criteria	22
5.14 Principles referred to in Chapter VI of the Land Use Planning Act;	22
5.14.1 Spatial justice	22
5.14.2 Spatial sustainability	22
5.14.3 Efficiency principle	22
5.14.4 Spatial Resilience Principle	22
5.14.5 Good Administration Principle	23
5.15 Provisions of the zoning scheme.....	23
5.16 Any restrictive condition.....	23
5.17 Impact on any heritage resources.....	23
6. CONCLUSION	23

FIGURES

Figure 2.1	:	Location of Remainder Erf 6846, Stellenbosch
Figure 2.2	:	Aerial photograph illustrating Remainder Erf 6846, Stellenbosch in its context
Figure 2.3	:	Remainder Erf 6846, Stellenbosch close-up aerial photograph
Figure 2.4	:	Extracts from Sheets 1 and 2 of SG Diagram 9620/1967 – the General Plan for Cloeteville Village
Figure 2.5	:	Sheet 3 of SG Diagram 4719/2006 for unregistered Erf 15095, Stellenbosch
Figure 2.6	:	Future services servitudes to be registered
Figure 2.7	:	Zoning of property and surrounds
Figure 2.8	:	Municipal sewage disposal network
Figure 2.9	:	Municipal water reticulation network
Figure 2.10	:	Municipal electrical supply network
Figure 3.1	:	Drone survey of western portion of Remainder Erf 6846
Figure 3.2	:	Drone survey of eastern portion of Remainder Erf 6846
Figure 5.1	:	Stellenbosch SDF 2019: Extract from Figure 28 Spatial plan for Stellenbosch

LIST OF APPLICATION DOCUMENTATION SUBMITTED

Attachment 1:	Application form
Attachment 2:	Pre-application scrutiny documentation
Attachment 3:	Motivation report (this document)
Attachment 4:	Subdivision Plan for Unregistered Erf 15095 - General Plan 4702/2006
Attachment 5:	Original approvals

Attachment 6:	Title deed for Remainder Erf 6846, Stellenbosch
Attachment 7:	Power of attorney
Attachment 8:	Conveyancer's certificate
Attachment 9:	SG Diagrams for Remainder Erf 6846, Stellenbosch and unregistered Erf 15095, Stellenbosch
Attachment 10:	Locality plan

1. INTRODUCTION

1.1 Appointment

Lize Malan has been duly appointed by the Stellenbosch Municipality, owner of unregistered Erf 15095/Remainder Erf 6846, Stellenbosch, to make an application for the subdivision of said property. The application is required as the subdivision, that was approved on 1 July 2005, has lapsed in terms of Section 27(2) of the Land Use Planning Ordinance (Ordinance 15 of 1985), as none of the subdivided erven has been transferred from the owner, the Stellenbosch Municipality to another entity (i.e., exceeding the five-year period). This application is funded by Khaya Lam, an NPO, with whom the Municipality has signed a Memorandum of Understanding, which facilitates the transfer of subsidised housing to the intended beneficiaries.

1.2 Background

Unregistered Erf 15095, Stellenbosch is known as The Steps in Cloetesville. The development entailed an innovative infill housing project that dates to early 2005/2006 which saw the repurposing of a public open space that was not optimally utilised. This project was undertaken in parallel with a similar project known as Orlean Lounge, also in Cloetesville, that is the subject of a similar reapplication process.

The subdivision of the property per General Plan 4702/2006, was approved in 2005 by the Stellenbosch Municipality.

The subsidised housing (free-standing and attached duplexes) was constructed in 2005/2006, but as noted, none of the units was transferred to intended beneficiaries. The reason for this is unclear.

1.3 Summary of Application

The following application is made in terms of the Stellenbosch Municipality: By-law on Municipal Land Use Planning of 2023 (SMBMLUP).

1.3.1 Subdivision of Remainder of Erf 6846, Stellenbosch in terms of Section 15(2)(d) of the SMBMLUP: A subdivision of land that is not exempted in terms of section 24, including the registration of a servitude or lease agreement.

2. APPLICATION CONTEXT

2.1 Locality

Unregistered Erf 15095, Stellenbosch is known as The Steps in Cloetesville. The development was an infill housing project that dates to 2005/2006. Figure 2.1 illustrates the location of the property in the context of Stellenbosch and Figures 2.2 and 2.3 provide aerial photographs which illustrate the property in its context and existing development on site. The property is a former public open space that has been formally closed for this development. It is bounded by Long Street to its east and Curry Street to its west, with road connections to the crescents of Primrose, Pine, Jakaranda and Eike Streets to the north and south.

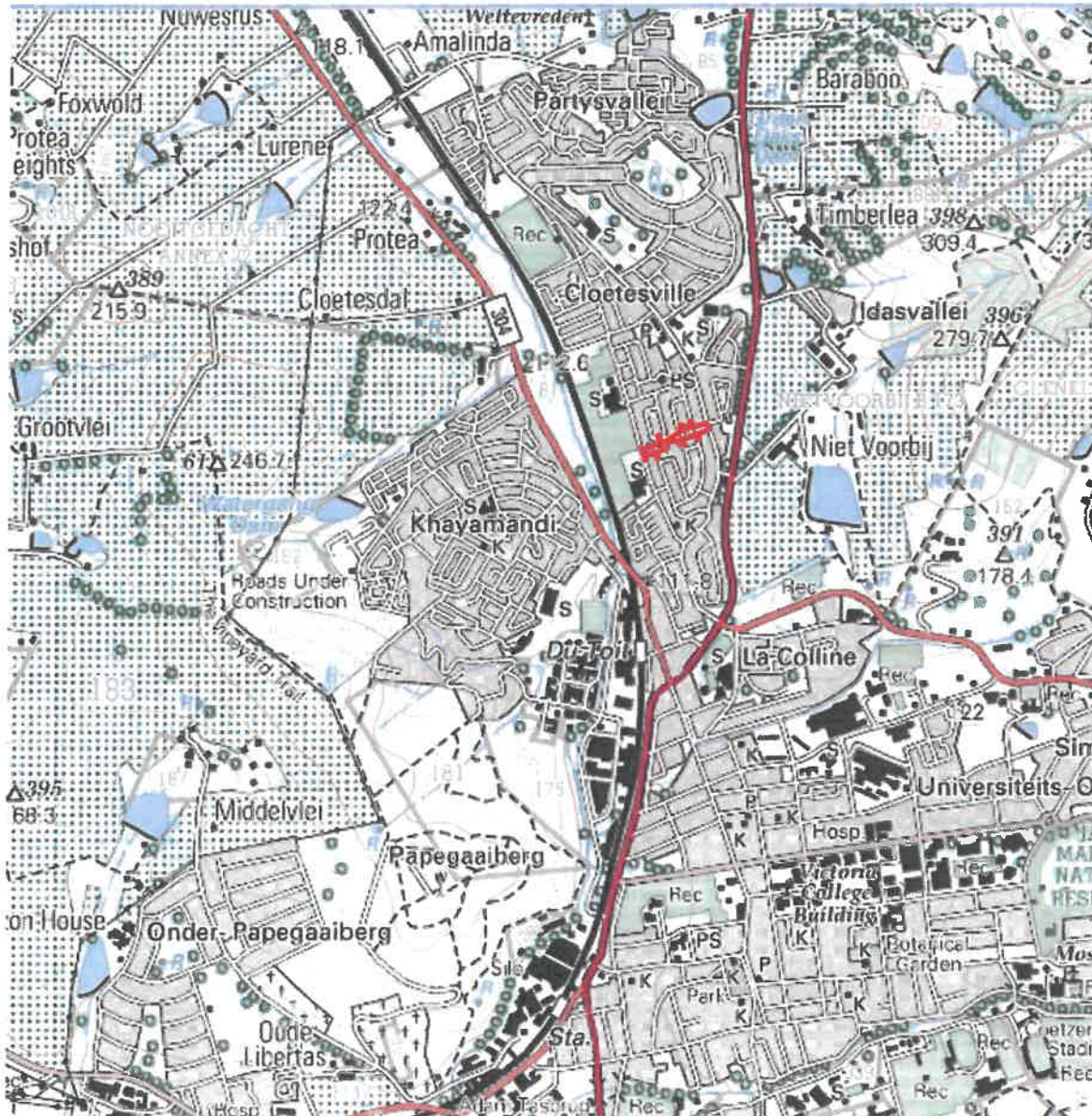


Figure 2.1 Location of Remainder Erf 6846, Stellenbosch (Source: Extract from 1:50 000 Topographical map 3318DD Stellenbosch, 2010, National Geo-spatial Information)



Figure 2.2: Aerial photograph illustrating Remainder Erf 6846, Stellenbosch in its context (Source: <https://gis.elsenburg.com/apps/cfm/>)

SUBDIVISION APPLICATION: Remainder Erf 6846, Stellenbosch



Figure 2.3: Remainder Erf 6846, Stellenbosch close-up aerial photograph (Source: <https://gis.elsenburg.com/apps/cfm/>)

2.2 Property Details

Table 2.1 provides a summary of the subject property details:

Erf No.	Remainder Erf 6846, Stellenbosch (Unregistered Erf 15095, Stellenbosch)
Owner	Stellenbosch Municipality
Total Extent	10 358.3m ²
Title Deed No.:	T31788/1973
Title Deed Restrictions	None
SG Diagram No.	Re Erf 6846: 9620/1967 Unregistered Erf 15095: 4719/2006
Servitudes	None
Current Zoning	Conventional Residential
Current Land Use	Residential
Applicable Zoning Scheme	Stellenbosch Municipal Zoning Scheme By-law (2019)
Overlay Zones:	None
Metropolitan/Provincial Rd:	No
Property affected by Road widening:	No
National Heritage Resources Act	No
NEMA Regulations Applicable	No
Comply with Policy/Structure Plans	Yes

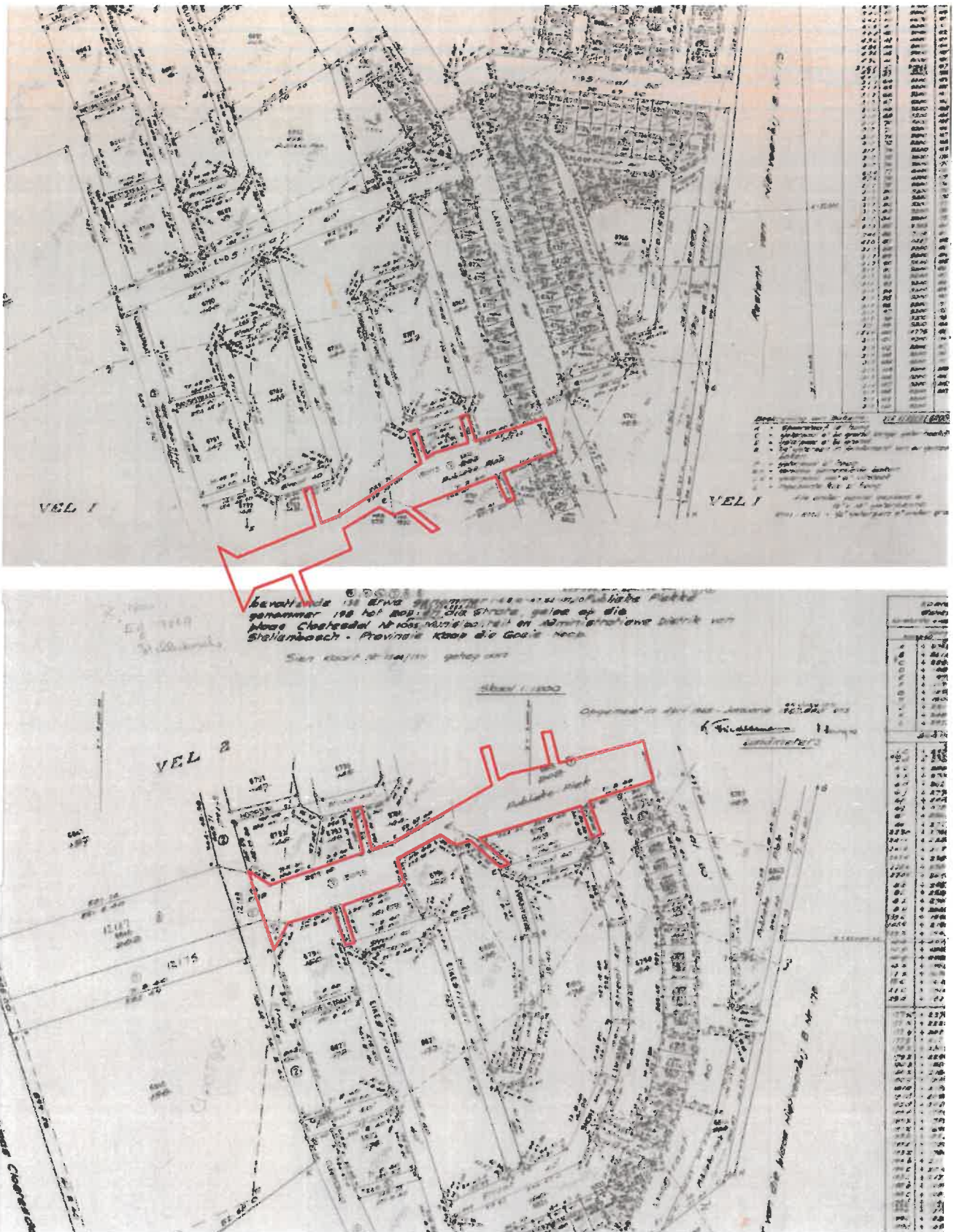


Figure 2.4: Extracts from Sheets 1 and 2 of SG Diagram 9620/1967 – the General Plan for Cloeteville Village. The location of Remainder Erf 6846 outlined in red.

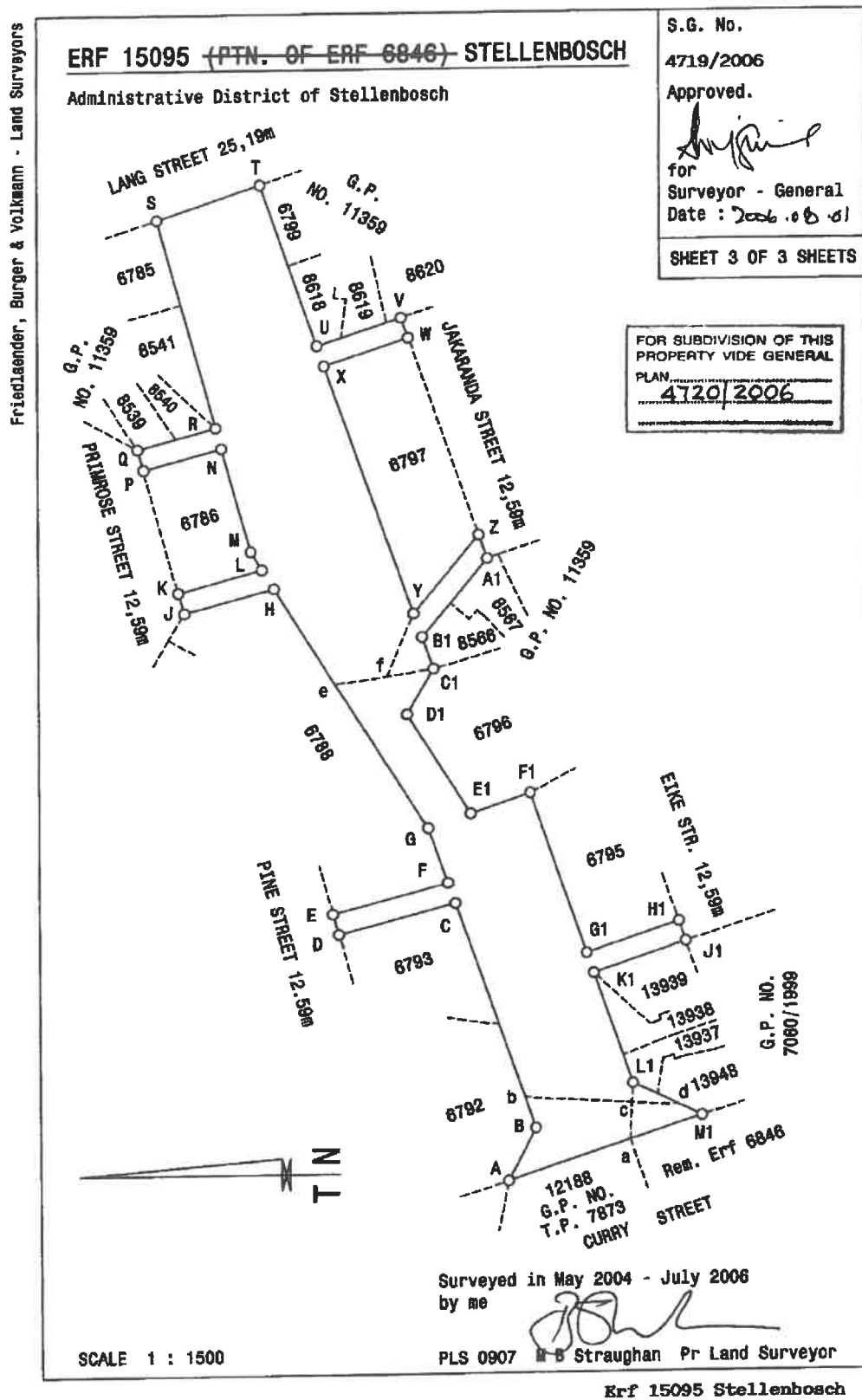


Figure 2.5: Sheet 3 of SG Diagram 4719/2006 for unregistered Erf 15095, Stellenbosch

2.3 Title Deed Conditions and Existing Servitudes

There are no restrictions title deed conditions of relevance to this application. Please also refer to the conveyancer's certificate that is included in this submission.

There are currently no REGISTERED servitudes affecting the property. However the previously approved General Plan indicates a number of servitudes, accommodating municipal services, that will be formally registered once the subdivision has vested at the Deeds Office. These are already captured on Cape Farm Mapper, although they have no official status at this stage.



Figure 2.6: Future services servitudes to be registered (Source: Cape Farm Mapper)

2.4 Zoning

All the individual erven which constitute Re Erf 6846, Stellenbosch have a Conventional Residential Zoning. Refer to Figure 2.7 below.

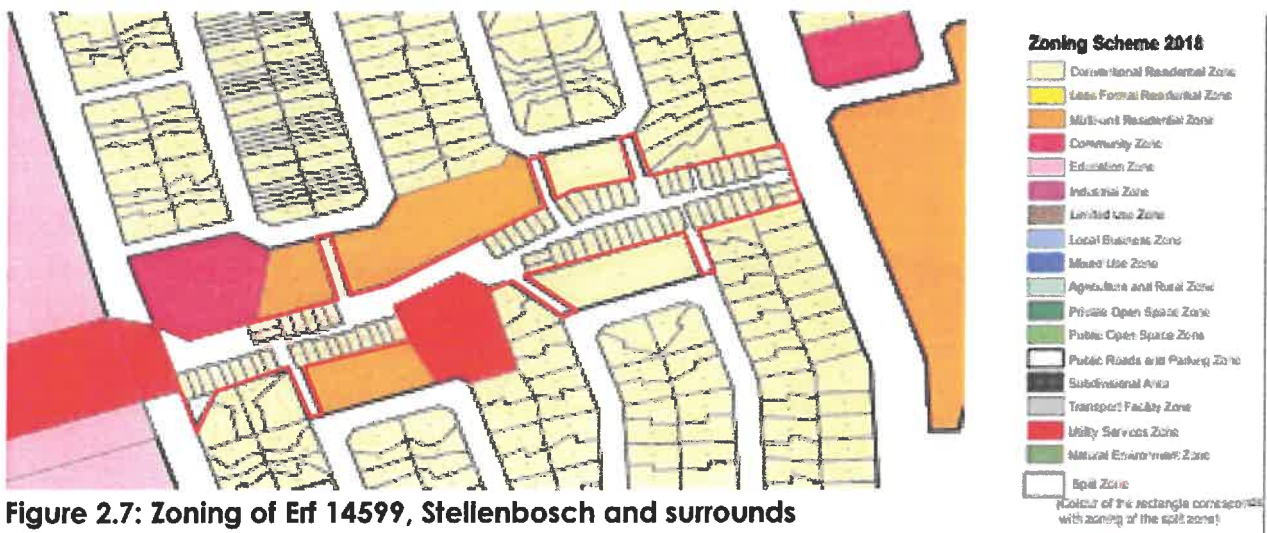


Figure 2.7: Zoning of Erf 14599, Stellenbosch and surrounds

2.5 Existing and Surrounding Land Use

The unregistered erven which constitute Remainder Erf 6846 accommodate attached duplex units in groups of two, three and four. The site is located within the larger residential area of Cloetesville – to the north and south of the site are small blocks of flats of four units each. To the north-west of the site is a Methodist Church. A large school site is located to the west of site on the other side of Curry Street.



Photograph 1: The Steps as viewed from Long Street, with its central open spine visible (August 2023).



Photograph 2: The Steps as viewed from Eike Street at the western end of the development (August 2023).



Photograph 3: Looking east from Eike Street along the pedestrian route running through the development (Google Streetview, October 2022).



Photograph 4: Looking west from Jakaranda Street along the pedestrian route running through the development (Google Streetview, October 2022).



Photograph 5: The Steps as viewed from Pine Street (Google Streetview, October 2022).

2.6 Existing Engineering Services

The individual units that constitute the site in question are serviced by the Municipal water, sewage, and electricity reticulation networks.



Figure 2.8: Screenshot from Municipal database illustrating the water network and connections for Re Erf 6846, Stellenbosch



Figure 2.9: Screenshot from Municipal database illustrating the sewage disposal network and connections for Re Erf 6846, Stellenbosch



Figure 2.10: Screenshot from Municipal database illustrating the electricity network for Re Erf 6846, Stellenbosch

2.7 Previous Approvals

2.7.1 Subdivision approval

On 1 July 2005, the Stellenbosch Municipality issued a letter of approval for the subdivision of (unregistered) Erven 14599 and 15095, Stellenbosch – i.e. the application for Orlean Lounge and The Steps. The approval letter is submitted with this application as a separate electronic document.

The conditions of approval of the subdivision were as follows:

- The approved General Plans must be submitted to the office for record and final registration purposes;
- The requirements as stated in regulations 3.5 and 3.6 of the Scheme Regulations which have been promulgated in terms of Section 7(2) of the Ordinance 15 of 1985 (PN 1047/1988) must be complied with¹; and
- Services must be provided to the subdivision in accordance with Regulation 39 of the regulations promulgated in terms of Section 47(1) of Ordinance 15 of 1985. (In this regard your attention is invited to the Provincial Administration Circulars LG/PB 15/1986 dated 1986-06-20 and LG/PB 17/1986 dated 1986-07-09.

2.7.2 Closure of public places and streets

Prior to the subdivision approval, the closure of the Erf 6846, Stellenbosch as a public place was approved and gazetted in terms of Section 137(1) of Ordinance 20 of 1974 (Gazette Notice 62, 29 April 2004).

2.7.3 Rezoning and departure approval

¹ These sections refer to provision of services across the erven created and permitting construction on a land unit of subdivision that has not been confirmed respectively.

On 1 December 2008, after the project was constructed, the Stellenbosch Municipality approved the rezoning of unregistered Erven 15098 to 15169 (portions of unregistered Erf 15095) from Public Open Space to Subdivisional Area to allocate the zoning of Group Housing to these portions and the rezoning of unregistered Erven 15096 and 15097 to Subdivisional Area to allocate a zoning of Local Authority (Street purposes) to these portions.

In addition, the following departures were approved in order to relax the following requirements:

- The street building line to 1m and the common building lines to 0m, provided that where a building is erected less than 1m from a side boundary no windows and doors shall be permitted in the wall concerned, provided further that if a midblock sewage system is provided, the Council may require a rear building line of up to 2m.
- The minimum common open space of 40m² per dwelling to 0m.
- The two required parking bays for a dwelling to none.
- The density requirements, in order to increase it to 80 dwelling units per gross hectare.
- The requirement to provide service yard and private outdoor space, in order not to provide any.

The only conditions of approval stated that the approval applies only to the rezoning and departure in question, as indicated on Appendix 3 and Appendix 4 and shall not be construed as authority to depart from any other legal prescriptions or requirements; and the Council reserves the right to impose further conditions if needed. Appendix 3 and 4 included copies of the General Plans and SDPs.

3. PROPOSAL

This application simply entails a re-application for the subdivision of Unregistered Erf 15095, Stellenbosch as per General Plan 4702/2006, that was approved in 2005. This plan is included in this submission.

It is acknowledged that since the units have been constructed and occupied, numerous extensions were added to the properties, many of which encroach on both building lines as well as the proposed erf boundaries, despite the departures granted. The current footprint of structures on the site was surveyed through high resolution drone footage in August 2023 and the approved General Plan was superimposed on the aerial photograph and accurately geo-referenced to provide a clear picture of the extent of encroachments². The diagram overleaf illustrates the results of the drone survey.

In discussion with the Municipality, it was agreed, that these encroachments cannot simply be condoned in a blanket fashion, especially the encroachments into the future road reserves, through either departure applications and/or a re-subdivision. On the other hand, as the properties currently in effect belong to the Municipality, the occupants/future beneficiaries cannot at this stage make any application to regularise the situation.

It was thus agreed that an application should be made for the previously approved plans, with a recommendation that as a condition of approval, all beneficiaries who have extended the original built footprint on their property, should apply to the Municipality to have the building plans for the extensions approved, once the properties have been transferred in their name, or

² It is of course acknowledged that since the survey, the situation on the ground could have changed.

risk prosecution by the Municipality. This aspect must be clearly communicated to beneficiaries at the time that the Municipality engage with beneficiaries to prepare the necessary transfer documents.

SUBDIVISION APPLICATION: Remainder Erf 6846, Stellenbosch



Figure 3.1: Drone survey of western portion of Remainder Erf 6846, with general plan superimposed to illustrate the extent and nature of encroachments (prepared by Middleton Geomatics, August 2023)

SUBDIVISION APPLICATION: Remainder Erf 6846, Stellenbosch



Figure 3.2: Drone survey of eastern portion of Remainder Erf 6846, with general plan superimposed to illustrate the extent and nature of encroachments (prepared by Middleton Geomatics, August 2023)

4. LEGISLATIVE AND POLICY CONTEXT

4.1 National Environmental Management Act (No. 107 of 1998) (NEMA)

As the subject property fall inside the urban area of Stellenbosch and the houses are already constructed, the provisions of NEMA are not applicable to this application.

4.2 National Heritage Resources Act (No. 25 of 1999) (NHRA)

The proposed development does not trigger any of the provisions of Section 38 of NHRA, nor are any of the buildings on the site older than 60 years, i.e. Section 34 is also not applicable. No other provisions of the NHRA are applicable.

4.3 Spatial Planning and Land Use Management Act (No. 16 of 2013) (SPLUMA)

The Spatial Planning and Land Use Management Act (No. 16 of 2013) (SPLUMA) is the overarching planning legislation enacted on 1 July 2015 which provides the legal framework for laws adopted at provincial and local government levels. It repealed a number of previous acts and contains overall planning and development principles which must guide all land development in the country. These principles are:

- i) Principle of spatial justice
- ii) Principle of spatial sustainability
- iii) Principle of efficiency
- iv) Principle of spatial resilience
- v) Principle of good administration

4.4 Western Cape Land Use Planning Act (No. 3 of 2014) LUPA

At the same time as SPLUMA, the Western Cape Government's Land Use Planning Act (No. 3 of 2014) (LUPA) came into operation and it has been enacted in the Stellenbosch Municipality. In terms of this legislation, the Municipality shall decide on the applications related to this proposal.

4.4.1 Provincial comment or approval

Section 45 of LUPA, requires Provincial comment on applications which are outside the urban limits of a municipality; where agricultural land or conservation land is rezoned; where development affects a provincial function; or any application which falls in a category identified by Province as supporting/strengthening a municipality. This application does not fall in any of these categories.

4.4.2 Criteria for evaluation of applications

Section 19 of the Land Use Planning Act, No 3 of 2014 requires that applications be either compliant or consistent with a spatial development framework.

In terms of Section 49 of LUPA, when considering a land use application, a municipality must have regard for at least the following:

- i) The applicable spatial development frameworks;
- ii) The applicable structure plans;
- iii) The principles referred to in Chapter VI (Section 59):
 - a. Spatial Justice
 - b. Spatial Sustainability
 - c. Efficiency
 - d. Good Administration
 - e. Spatial Resilience

- iv) The desirability of the proposed land use; and
- v) Guidelines that may be issued by the Provincial Minister regarding the desirability of proposed land use.

4.5 Stellenbosch Municipality: By-law on Municipal Land Use Planning (2023) SMBMLUP

The SMBMLUP specifies the application process which must be followed for an application to the Municipality as well as the criteria for decision making which are set out in Section 65 of the by-law. With regard to this application, Section 65 stipulates the municipality must have regard to the following:

- (a) the application submitted in terms of this By-law;
- (b) the procedure followed in processing the application;
- (c) the desirability of the proposed utilisation of land and any guidelines issued by the Provincial Minister regarding the desirability of proposed land uses and which relevant desirability considerations for the assessment of the proposed use or development of land includes the -
 - (i) socio-economic impact;
 - (ii) compatibility with surrounding uses;
 - (iii) impact on the external engineering services;
 - (iv) impact on safety, health and wellbeing of the surrounding community;
 - (v) impact on heritage;
 - (vi) impact on the biophysical environment;
 - (vii) traffic impacts, parking, access and other transport related considerations; and
 - (viii) whether the imposition of conditions can mitigate an adverse impact of the proposed use or development of land.
- (d) the comments in response to the notice of the application, including comments received from organs of state, municipal departments and the Provincial Minister in terms of section 45 of the Land Use Planning Act;
- (e) the response by the applicant, if any, to the comments referred to in paragraph (d);
- (f) investigations carried out in terms of other laws that are relevant to the consideration of the application;
- (g) a written assessment by a registered planner appointed by the Municipality in respect of an application for—
 - (i) a rezoning;
 - (ii) a subdivision of more than 20 cadastral units;
 - (iii) a removal, suspension or amendment of a restrictive condition if it relates to a change of land use;
 - (iv) an amendment, deletion or imposition of additional conditions in respect of an existing use right;
 - (v) an approval of an overlay zone contemplated in the zoning scheme;
 - (vi) a phasing, amendment or cancellation of a subdivision plan or part thereof;
 - (vii) a closure of a public place or part thereof;
- (h) the impact of the proposed land development on municipal engineering services;
- (i) the integrated development plan, including the municipal spatial development framework;
- (j) the integrated development plan of the district municipality, including its spatial development framework, where applicable;
- (k) the applicable local spatial development frameworks adopted by the Municipality;

- (l) the applicable structure plans;
- (m) the applicable policies of the Municipality that guide decision making;
- (n) the provincial spatial development framework;
- (o) where applicable, a regional spatial development framework contemplated in section 18 of the Spatial Planning and Land Use Management Act and provincial regional spatial development framework;
- (p) the policies, principles and the planning and development norms and criteria set by the national and provincial government;
- (q) the matters referred to in section 42 of the Spatial Planning and Land Use Management Act;
- (r) the principles referred to in Chapter VI of the Land Use Planning Act;
- (s) the applicable provisions of the zoning scheme;
- (t) any restrictive condition applicable to the land concerned; and
- (u) the impact of the proposed land development on any heritage resources as defined in the National Heritage Resources Act, 1999 (Act 25 of 1999)

5. MOTIVATION

The various levels of planning legislation (SPLUMA, LUPA and the Municipal Land Use Planning By-Law) require that a variety of principles and assessment criteria be applied when assessing development applications. This chapter aims to motivate the proposal at the hand of these various principles and criteria. The motivation is set out according to the criteria for assessment in Section 65 of the the Stellenbosch Municipality: By-law on Municipal Land Use Planning (2023).

5.1 Desirability

5.1.1 Socio-economic impact

The proposed sub-division is aimed at facilitating the transfer of the individual properties to the identified and vetted beneficiaries. This will result in empowerment of these households as homeowners – resulting in security of tenure and owning an asset that can provide accommodation and financial security for current and subsequent generations. The property could also serve as collateral for loans in support of education, etc. At its heart, the purpose of this application is to create a positive socio-economic impact.

5.1.2 Compatibility with surrounding uses

As the duplex units are already constructed and occupied, and forms part of a larger residential area, it is evident that the land use is compatible with the surrounding uses. It is noted that the surrounding houses, are already in private ownership. The subdivision and transfer for these properties will thus tie in with the area.

5.1.3 Impact on external engineering services

The individual properties are all serviced by the municipality already and so will have no impact on external engineering services.

5.1.4 Impact on safety, health and wellbeing of the surrounding community

As the duplex units were constructed in 2005/2006 already (and the development is integrated into the local area), the proposal will have no impact on the existing security, health and wellbeing conditions of the community.

5.1.5 Impact on heritage

The proposal will not impact on any heritage resources. In this regard it is noted that the development dates to 2005/2006.

5.1.6 Impact on bio-physical environment

The development is already constructed, and the proposed subdivision will have no impact on the bio-physical environment.

5.1.7 Traffic impacts, parking, access and other transport related considerations

As the development is already constructed, the impacts on traffic, parking, access and transport have already manifested. It is noted that many of the individual units have been extended, with encroachments into the future road reserve. This situation is not unique to this development – it is commonplace throughout the Municipality. However, it cannot be condoned and thus it is suggested that as a condition of approval of the subdivision application, all beneficiaries will be required to submit building plans to the Municipality for approval of the extensions/additions to regularise encroachments of building lines and erf boundaries.

5.1.8 Conditions that can mitigate adverse impacts

As proposed in Section 5.1.7 above, it is proposed that as a condition of approval, all beneficiaries are required to submit building plans to the Municipality, once they have taken transfer of the properties, to regularise encroachments of building lines and erf boundaries, or risk prosecution.

5.2 Comments in response to advertising & applicants response

It is the intention to apply for an exemption from the provisions of Sections 45 and 47 of LUPA, to the Western Cape Provincial Government. Should this be successful this requirement will not be applicable to the application.

5.3 Investigations carried out in terms of other laws

No investigations in terms of other legislation were required for this application.

5.4 Assessment by registered planner appointed by Municipality

To be undertaken by Municipality.

5.5 Impact on municipal engineering services

As the development is already serviced by Municipal service networks, the subdivision will not result in any impact on engineering services.

5.6 Stellenbosch Municipality Integrated Development Plan (IDP) and Spatial Development Framework (SDF)

Section 19 of the Land Use Planning Act (No. 3 of 2014) requires that applications be either compliant or consistent with a Spatial Development Framework (SDF). Consistency is achieved when the proposal is not specifically provided for in the plan, but the proposal is also not in conflict with the plan. As the development is already constructed, it is in fact reflected as existing urban development. The proposal is thus consistent with the SDF.



Figure 5.1: Extract from Figure 28 Stellenbosch Town Plan from the Stellenbosch Municipality Spatial Development Framework as adopted by Council, November 2019. The location of Remainder Erf 6846, Stellenbosch is indicated with a yellow dashed circle.

5.7 District SDF

The Cape Winelands District SDF (2021-2026) does not provide sufficient detail to have a bearing on this application.

5.8 Local SDFs

There is no local SDF for this area of Stellenbosch.

5.9 Structure Plans

There are no structure plans applicable to the property.

5.10 Municipal policies

There are no Municipal policies relevant to this application.

5.11 Provincial SDF

The Western Cape Provincial Spatial Development Framework, 2014 (PSDF) was prepared in terms of Section 13 of SPLUMA and Section 4 of LUPA, with inter alia the aim to coordinate, integrate and align the plans, policies and development strategies of municipalities (PSDF, 2014: 12). As such the PSDF was prepared at a higher level which does not provide specific guidance for the land use management of individual/specific properties and has no direct relevance to this application.

5.12 Regional SDF

There are no regional SDFs applicable to the site, except for the District SDF referred to above.

5.13 National and Provincial policies, principles, planning and development norms and criteria

There are no other specific policies, norms and criteria set by the National and Provincial Government that have direct bearing on this application, other than the guiding principles of SPLUMA and LUPA, which are discussed in Section 5.14 below.

5.14 Principles referred to in Chapter VI of the Land Use Planning Act;

5.14.1 Spatial justice

The spatial justice principle requires that past spatial and development imbalances be redressed through improved access to and utilisation of land. It requires that persons which were previously excluded (especially the poor) must be included in land use planning policies, especially in order to address widespread poverty and deprivation. Access to land for all (including disadvantaged communities) should be facilitated.³ This project whilst not providing "new" access to land, will result in security of tenure, which is in line with this principle.

5.14.2 Spatial sustainability

The principle of spatial sustainability will be achieved by a development when a development is spatially compact, resource frugal and within the means of the municipality. It must protect prime agricultural land and must take into consideration all other environmental issues. It must stimulate the land market and must consider all the costs of infrastructure (future and current) as well as the provision of social services. It must aim to limit urban sprawl, result in viable communities and strive to meet the basic needs of citizens in an affordable way.⁴ Development must also ensure the sustained protection of the environment (ecological corridors, biodiversity, heritage resources, promote provincial tourism and avoid development of steep slopes, floodplains, wetlands etc.). Energy efficiency should be promoted.⁵

The proposal, by virtue of having been physically implemented already, could be regarded as neutral with respect to this principle.

5.14.3 Efficiency principle

The principle of efficiency requires that development should optimise the use of existing resources, including infrastructure⁶, and requires that integrated cities and towns be developed whereby social, economic and institutional aspects of land development is integrated and residential opportunities are provided close to employment opportunities. A diversity of land uses are to be incorporated and the spatially distorted patterns of the past are to be corrected. Towns should be of sufficient density and urban sprawl must be discouraged.⁷ Similar to 5.14.2, the proposal could be regarded as neutral with respect to this principle.

5.14.4 Spatial Resilience Principle

³ Section 7 (a) of SLUMA and section 59(1) of LUPA

⁴ Section 7(b) of SPLUMA and section 59(2)(a) of LUPA

⁵ Section 59(2)b of LUPA

⁶ Section 7(c) of SPLUMA

⁷ Section 59(3) of LUPA

The principle of spatial resilience requires flexibility in land use management systems and policies to ensure sustainable livelihoods for communities most likely affected by economic and environmental shocks.⁸

This proposal will not necessarily contribute to spatial resilience, but the fact that it will lead to property ownership could contribute to creating more sustainable livelihoods.

5.14.5 Good Administration Principle

The good administration principle requires that the application follows the correct procedures as prescribed in law. The Municipality will have to ensure that the application is complete and correctly processed.

5.15 Provisions of the zoning scheme

This application is for the subdivision of Remainder Erf 6846, Stellenbosch, in terms of Section 15(2)(d) of the Stellenbosch Municipality: By-law on Municipal Land Use Planning of 2023, only. It is acknowledged that the subdivision will in effect result in many of the individual properties being in contravention of certain provisions of the Stellenbosch Municipality Zoning Scheme, because of additions to the original structures. Such contraventions would include encroachment on building lines, erf boundaries and the lack of on-site parking. However, it was agreed with Municipal officials, that this problem can be resolved most effectively once the properties have been transferred. The beneficiaries will then have to take responsibility for these issues. It is thus suggested that informing the beneficiaries of the intended action at the time of signing the contracts to purchase and the serving of notices on the individual owners once the properties are transferred, is set as a condition of approval of this application.

5.16 Any restrictive condition

There are no restrictive title conditions pertaining to this application.

5.17 Impact on any heritage resources

No heritage resources will be impacted by this application.

6. CONCLUSION

The motivation for this application is simply to enable the Municipality to transfer houses to the originally intended beneficiaries of this housing project. Whereas the subsequent additions to the original houses are a complication, it must be borne in mind that this is commonplace throughout the Municipality. Furthermore, the Municipality, as the current landowner, cannot take responsibility for these contraventions of the Zoning Scheme and it is regarded as inappropriate to apply for blanket departures at this stage or amend the general plan. Municipal officials have agreed that it would be fair and efficient to place the responsibility for regularising the situation with the beneficiaries and to consider the contraventions on a case-by-case basis.

Thus, the recommendation is made that this application for subdivision of Remainder Erf 6846, Stellenbosch, as per General Plan 4702/2006, included in this submission, is approved on condition that the Municipality undertakes to:

⁸ Section 7d) of SPLUMA
March 2024

- Inform vetted beneficiaries of their responsibilities in terms of the SMBMLUP and Zoning Scheme at the time that the contracts to purchase the erven thus created are signed.
- Serve notices on the owners, once the transfers have taken place, to make the necessary applications and/or on-site alterations to ensure compliance with the Stellenbosch Zoning Scheme.

ANNEXURE H:

Western Cape Department: Environmental Affairs
and Development Planning, Development
Management (Region 2) LUPA Section 60
Exemption Application.

2046, Klipmuts
Ex 15095, Stellenbosch
14599, "



**Western Cape
Government**

Department: Environmental Affairs and Development Planning
Directorate: Development Management (Region 2)

Mr K Munro

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Reference number: 15/3/1/11/3/BS3

The Municipal Manager
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7600

FILE NR:	OUTGOING POST
Erf 2046 KL	
SCAN NR:	
COLLABORATOR NR:	770609

APPLICATION FOR PROVINCIAL EXEMPTION IN TERMS OF SECTION 60 OF THE WESTERN CAPE LAND USE PLANNING ACT (LUPA), ACT 3 OF 2014: OBTAINING THE NECESSARY LAND USE RIGHTS AND REGISTRATION OF DIAGRAMS IN THE SURVEYOR-GENERAL'S OFFICE FOR THREE HOUSING PROJECTS IN KLIPMUTS AND CLOETESVILLE, STELLENBOSCH

1. Your letter dated 3 July 2024, refers.
2. Since public participation was undertaken in the past to obtain approval for township development in terms of LUPO, there is no need to present your request for exemption to the Minister. Circular DEA&DP 0011/2022 already provides the exemption you require, as it is specifically aimed at the incidences motivated in Klipmuts and Cloetesville.
3. You may therefore proceed to present the application to the Municipal Planning Tribunal.
4. Please note that the exemption by the Provincial Minister, to deviate from a provision of LUPA in terms of section 60, also exempts the Municipality from, or authorise the Municipality to deviate from, any provision in its own By-law that corresponds to the relevant provision in LUPA.
5. Notwithstanding the above exemption, nothing prevents the Stellenbosch Municipality from making the proposal known to interested and affected parties in terms of its own by-laws.

Kobus Munro

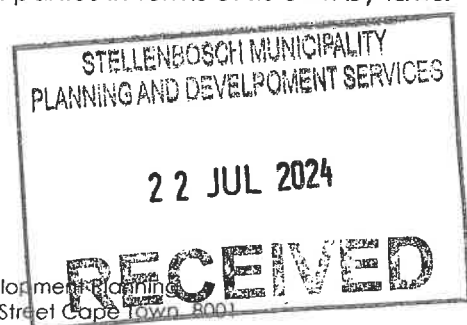
Digitally signed by Kobus Munro
Date: 2024.07.10 11:28:35 +02'00'

DIRECTOR: DEVELOPMENT MANAGEMENT (REGION 2)

Page 1 of 1

www.westerncape.gov.za

Department of Environmental Affairs and Development Planning
Cape Town Office: 2nd Floor, Utilitas Building, 1 Dorp, Street Cape Town 8001





STELLENBOSCH

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MUNISIPALITEIT • UMASIPALA • MUNICIPALITY

Your reference:

Our reference: 17/4/4/7/1+ 17/4/5/2

2024-07-03

MEC A Bredell
Minister: Local Government, Environmental Affairs and Development Planning
Western Cape Government
Department of Environmental Affairs and Development Planning
Private Bag X9086
CAPE TOWN
8000

Dear Sir/Madam

APPLICATION FOR PROVINCIAL EXEMPTION IN TERMS OF SECTION 60 OF THE WESTERN CAPE LAND USE PLANNING ACT (LUPA), ACT 3 OF 2014: OBTAINING THE NECESSARY LAND USE RIGHTS AND REGISTRATION OF DIAGRAMMS IN THE SURVEYOR-GENERAL'S OFFICE FOR THREE HOUSING PROJECTS IN KLAPMUTS AND CLOETESVILLE, STELLENBOSCH

Stellenbosch Municipality appointed a service provider to assist in obtaining the necessary land use rights and registration of diagrams in the Surveyor General's Office for three completed housing projects in Klapmuts and Cloetesville Stellenbosch.

The purpose of this letter is to apply for exemption from the Publication and Serving of Notices as required by Sections 44 to 48 and Section 51 of the Stellenbosch Municipal Land Use Planning By-law for all three completed projects, in terms of Section 60 of the Western Cape Land Use Planning Act (Act 3 of 2014).

More information regarding the three projects is provided below and in the following **Annexures** to this letter:

1. Annexure 1: Location of the three projects
2. Annexure 2: The approved general plans for the three projects

1. BACKGROUND

Stellenbosch Municipality has entered into partnership with an NGO, named Khaya Lam, who assists municipalities across the country to transfer houses still in municipal ownership but



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originally intended for transfer to the beneficiaries. They have assisted the Municipality with 2324 transfers to date. During their work with the Municipality, it has emerged that the subdivision approval for the three housing projects that is the subject of this letter, has lapsed in terms of Sectio 27(7) of LUPA as no properties were transferred within the prescribed legal period of 5 years from approval. The projects all date to the early 2000s.

Stellenbosch Municipality has subsequently initiated the planning application, with the assistance of Lize Malan, Planner, funded by Khaya Lam, to reapply for the subdivision of these three properties. This is necessary to enable the Municipality to finalise the formal registration of these properties with the Surveyor-General and the Deeds Office so that the title deeds of the properties can be transferred to the intended beneficiaries.

The properties in question are:

- Unregistered Erf 2046, Klapmuts – a portion of Remainder Erf 812, Klapmuts.
- Unregistered Erf 15095, Stellenbosch - Remainder Erf 6846, Stellenbosch and known as The Steps.
- Unregistered Erf 14599, Stellenbosch comprising of a portion of Erf 8937, Stellenbosch, Remainder Erf 6852, Stellenbosch, a portion of Erf 6851, Stellenbosch and Erf 6667, Stellenbosch and known as Orlean Lounge.

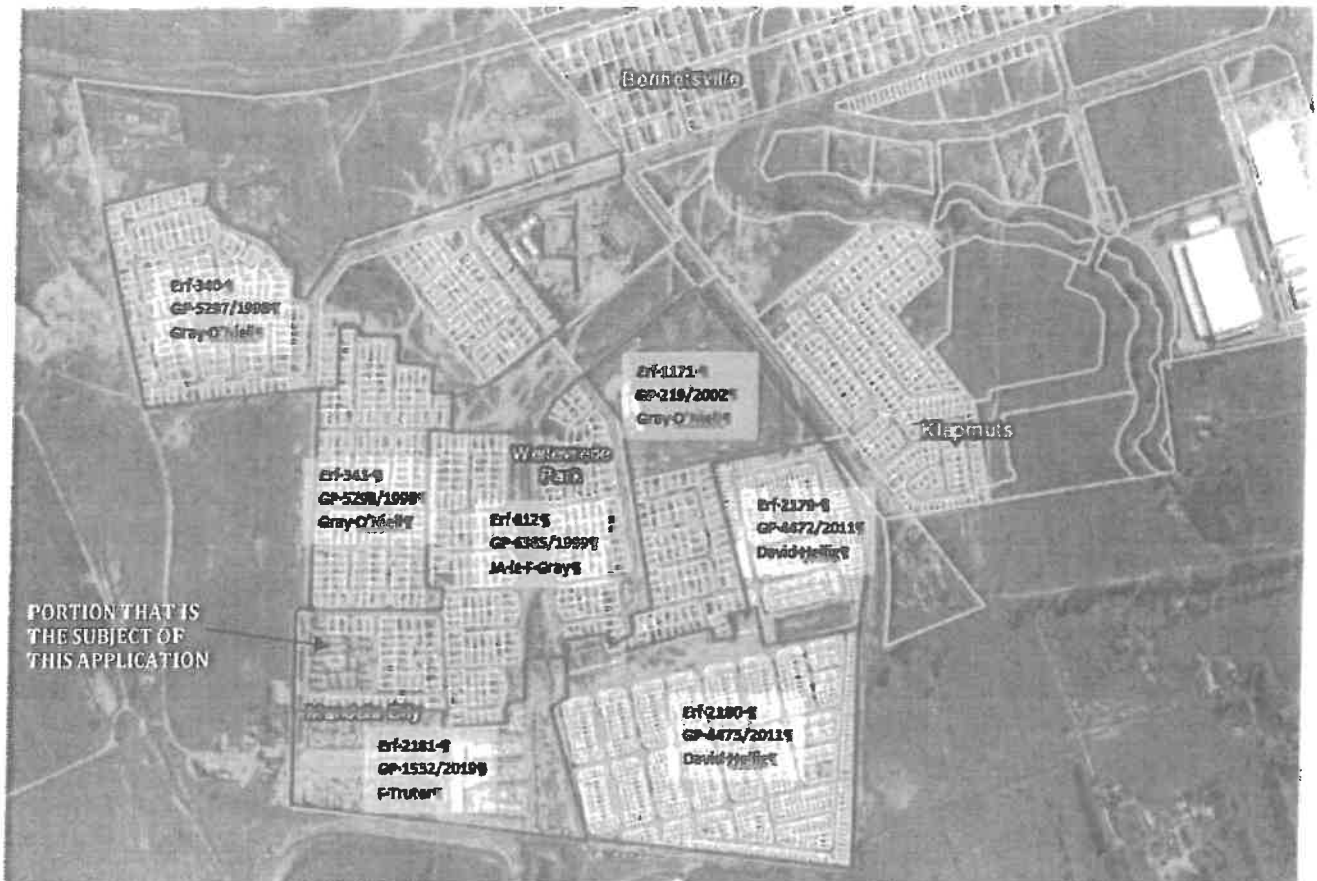
1.1 Unregistered Erf 2046, Klapmuts

In the 1990s, Klapmuts was identified as a node with considerable development potential, particularly to provide subsidised housing. At that stage large tracts of farmland were already in public ownership (registered to the former Regional Services Council for the area). The diagram below illustrates various general plans for subsidised housing development prepared in the late 1990s and early 2000s. These GPs were all related to specific projects, many of which had various phases of implementation.



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The site in question forms part of Erf 812, Klapmuts (GP approved in 1999), and the development is recognisable as the red roofs, with no erf boundaries. The history of the development and why the houses were never transferred is not quite clear but may be related to the fact that an application for an amendment of the General Plan for a portion of Erf 812, was made in 2008/2009. This portion was described as Erf 2046, but never registered at the Deeds Office. This application will in effect comprise an application for an amendment of the GP approved in 1999 by the Stellenbosch Municipality.

1.2 The Steps, Cloetesville

Unregistered Erf 15095, Stellenbosch is known as The Steps in Cloetesville. The development entailed an innovative infill housing project that dates to 2005/2006. The subdivision of the property per General Plan 4702/2006, was approved in 2005 by the Stellenbosch Municipality. Prior to this approval, the closure of Erf 6846, Stellenbosch as a public place was approved and gazetted (Gazette Notice 62, 29 April 2004). The rezoning of Erf 15095 from Public Open Space to Subdivisional Area to accommodate 72 group housing units and two street portions was subsequently approved on 1 December 2008, to regularise the situation.



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The subsidised housing (free-standing and attached duplexes) was constructed in 2005/2006, but as noted, none of the units was transferred to intended beneficiaries. The reason for this is unclear.

1.3 Orlean Lounge, Cloetesville

The Orlean Lounge development was undertaken in parallel with The Steps, and thus followed the same process. The subdivision of unregistered Erf 14599, Stellenbosch as per General Plan 4717/2006 was approved at the same time as The Steps in 2005, and similarly, prior to this, the closure of the public place (Erf 6852, Stellenbosch) and portions of public streets that formed part of the consolidated property (Gazette Notice 62, 29 April 2004).

On 1 December 2008 the rezoning of Erf 14599 from Specific Business, Public Open Space and Local Authority to Subdivisional Area, to accommodate 90 group housing units, and a street portion was approved. The housing units were constructed in 2007/2008, but as noted none of the units was transferred to intended beneficiaries. The reason for this is unclear.

2. OWNERSHIP

Unregistered Erven 2046, Klappmuts, 14599, Stellenbosch and 15095, Stellenbosch are owned by the Stellenbosch Municipality.

3. LAND USE APPLICATION REQUIRED

The following land use applications have been submitted to the Stellenbosch Municipality in terms of Section 15(2)(d) of the Stellenbosch Municipal Land Use Planning By-law:

- The subdivision of a portion of Remainder Erf 812, Klappmuts (unregistered Erf 2046, Klappmuts) into 51 portions (49 erven and 2 public streets).
- The subdivision of Remainder Erf 6846, Stellenbosch (unregistered Erf 15095, Stellenbosch) into 74 portions and roads.
- The subdivision of Erf 6667, Stellenbosch, Remainder Erf 6582, Stellenbosch, Portion of Erf 6581, Stellenbosch and Portion of Erf 8937, Stellenbosch (together comprising unregistered Erf 14599, Stellenbosch) into 90 portions.

4. MOTIVATION FOR EXEMPTION FROM SECTIONS 43 AND 44 OF LUPA

As stated earlier, the purpose of this letter is to apply for exemption from the Publication and Serving of Notices as required by Sections 44 to 48 and Section 51 of the Stellenbosch Municipal Land Use Planning By-law, for the three completed projects, in terms of Section 60 of the Western Cape Land Use Planning Act (Act 3 of 2014).



STELLENBOSCH

STELLENBOSCH • PNIEL • FRANSCHHOEK

MUNISIPALITEIT • UMASIPALA • MUNICIPALITY

We would like to highlight the following, as motivation for our request:

1. All three projects are located in an established urban area within the urban edge of the settlement.
2. All three projects have already been developed and dwelling units are already occupied.
3. All three projects have access to existing municipal engineering services.
4. As the projects are already constructed the provisions of National Environmental Management Act and the National Heritage Resources Act are not applicable to the proposed applications.
5. The primary objective of three land use applications is to reinstate the subdivision of the various properties according to the original General Plans so that the Municipality can transfer ownership of the registered properties to the intended beneficiaries.

The finalisation of the subdivision and the registration of the properties with the SG's Office and the transfer of ownership to the beneficiaries has become a matter of urgency. Many of the original intended beneficiaries do not live there anymore and the community is becoming increasingly impatient with the delays in this process.

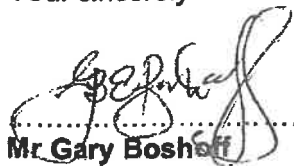
We believe that it would be in the best interest of the beneficiary community to shorten the land use authorisation processes for these three projects, due to the historical delays and reasons given above. The opportunity now exists to shorten the land use process for these three projects by dealing with it as a "technical approval" and not putting it through the normal advertisement (publication and serving of notices) processes. In this way, the approval timeframe can be shortened by at least 90-days.

After an approximately 15-year delay, it is also in the best interest of the Stellenbosch Municipality as well as the Western Cape Provincial Government to "pull out all the stops" to finalise this matter.

5 CONCLUSION

We sincerely hope that you will understand the importance and urgency of this matter and we thank you in advance for your favourable consideration of our request.

Your sincerely


 5/7/24
 Mr Gary Boshoff
 Acting Municipal Manager

ANNEXURE 1

Attachment to Section 60 Exemption Application

LOCATION OF PROPERTIES



Remainder Erf 8937 and Erf 8667, Stellenbosch/ unregistered Erf 14599, Stellenbosch – Orlean Lounge

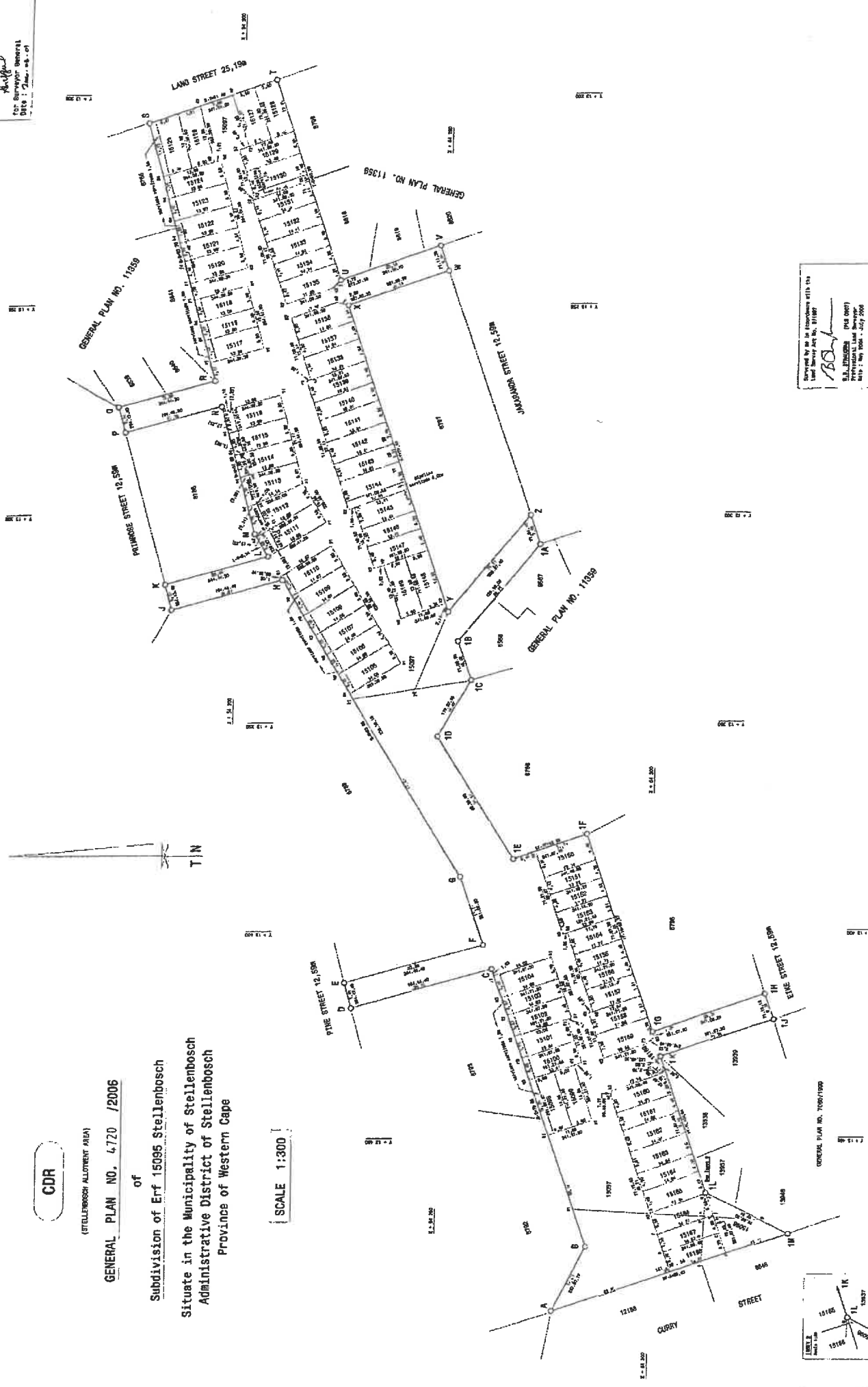


Remainder Erf 6846, Stellenbosch/unregistered Erf 15095, Stellenbosch – The Steps



Portion of Erf 812, Klapmuts/unregistered Erf 2046, Klapmuts

ANNEXURE 2



1:86 NO. 4711/2006

SHEET 2 OF 2 SHEETS

Approved:

For Surveyor General
Date: 2 Dec. 2006

GENERAL PLAN NO. 31678

ROAD 8927
JOSB ON WPC VERBOD

GENERAL PLAN NO. 8857

VREDLUST STREET 12,09m

CDR

(STELLENBOSCH ALLOTMENT AREA)

GENERAL PLAN NO. 4711/2006

of

Subdivision of Erf 14599 Stellenbosch

Situated in Clootshville Township in Stellenbosch Municipality
Administrative District of Stellenbosch
Province of Western Cape

SCALE 1:200

Drawn by all the members of the
Land Survey Act No. 137/1997
S.A. 10000 (10/10/2006)
Professional Land Surveyor
Date: 1 May 2006 - John Bosh

S.A. 10000 (10/10/2006)
Professional Land Surveyor
Date: 1 May 2006 - John Bosh

[illegible]

(STELLERBOORCH ALLOTMENT AREA)

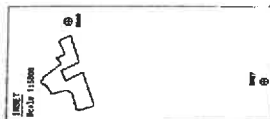
GENERAL PLAN NO. 4717 / 2006

of
Subdivision of Erf 14599 Stellenbosch

vide S.G. Diagram No. 4716/2008 annexed to D/T No. 1 and comprising 80 erven numbered 15172 - 15261 and Roads 15172 - 15261.

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Surveyed by ■ in accordance with the

J.D. Smith
D.P. Smith | (MLB 00007)
Professional Land Surveyor
Title : Mr. Smith - June 2008

[illegible]

O.G. FILE NO. 54161 VM.5
 SURVEY RECORD : 1759/2008
 COMPILATION : 0802-1241 (0803)
 0802-1240 (0808)
 LP1 C4476027

Tel: (021) 467 4800

Fax: (021) 465 3008

(R S A)

OFFICE OF THE SURVEYOR-GENERAL
PRIVATE BAG X9028
CAPE TOWN
8000

2005-02-18

FRIEDLAENDER, BURGER
AND VOLKMANN
PROFESSIONAL LAND SURVEYORS
P.O. BOX 154
STELLENBOSCH
7599

MY REF: STEL 81 p. 2004

Your ref : Erf 6667
Dated : 2004-04-22

Sir/Sirs

FINAL CERTIFICATE

**CLOSING OF PUBLIC PLACES ERVEN 6846 AND 6852 AS WELL AS CLOSING OF
PORTIONS OF PUBLIC STREET ADJOINING ERVEN 6784, 8949 TO 8951 AND 8968
STELLENBOSCH**

It is hereby certified that all my requirements in regard to the above have been met.

NB:

When submitting the final closure notice in terms of Section 137(1) of the Municipal Ordinance No 20 of 1974 OR Section 138(1) of the Divisional Council Ordinance No 18 of 1976 OR Section 6(1) of the By-law Relating to the Management and Administration of the Municipality's Immovable Property to the Director of Local Government, it must be accompanied by a copy of this certificate. Failure to do so, will lead to the refusal by the Director to publish the notice.

To expedite this matter please notify me after the final notice of closure has appeared in the Official Gazette.

The wording must be strictly in accordance with the above heading.

Yours faithfully

P W Hunt

P W HUNT
For SURVEYOR-GENERAL : CAPE TOWN

**NB: The Surveyor-General's
reference must be quoted
in the Notice of closure in
the Official Gazette.**

Navrae / Enquiries
U verwysing / Your ref.
Ons verwysing / Our Ref .
Datum / Date
Telefoon / Telephone
Faks / Fax
E-pos / E-mail

E van der Merwe
-
Erf 6846
2005-02-15
021-808 8660
021-808 8651
emilem@stellenbosch.org

The Surveyor-General : Cape Town
Private Bag X 9028
CAPE TOWN
8000

Sir

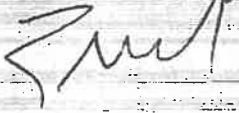
STATUS REPORT : CLOSING OF PUBLIC PLACES : ERVEN 6846 AND 6852 AS WELL AS CLOSING OF PORTIONS OF PUBLIC STREET ADJOINING ERVEN 6784, 8949 TO 8951 AND 8968, STELLENBOSCH

With reference to your letter dated 2004-05-12, I attach, for your information, a copy of a diagram surveyed by Friedlaender, Burger and Volkmann, Land Surveyors and a cheque for the amount of R830-00, being the endorsement fees.

Consent is hereby given in terms of Section 30(1) of Ordinance 15/1985 and Section 37(2) of the Land Survey Act 8/1997 to the amendment of General plan No 11378 by the *addition* of the portions of road to be closed, shown coloured orange on the attached Plan B, as one *additional* erf (with/without) conditions.

Your early attention to this matter will be appreciated.

Yours faithfully



for ACTING DIRECTOR : PLANNING AND ECONOMIC DEVELOPMENT SERVICES

2/ 6846

(R S A)

Tel: (021) 467 4800

Fax: (021) 465 3008

OFFICE OF THE SURVEYOR-GENERAL
PRIVATE BAG X9028
CAPE TOWN
8000

2004-05-12

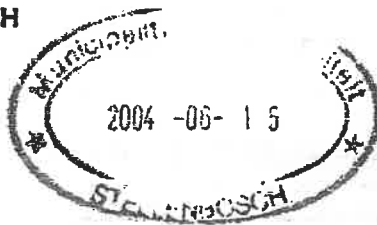
FRIEDLAENDER, BURGER AND
VOLKMANN
PROFESSIONAL LAND SURVEYORS
P.O. BOX 154
STELLENBOSCH
7599

MY REF: STEL 81 p. 2004

Your ref : Erf 6667
Dated : 2004-04-22

Note: THIS STATUS REPORT
IS VALID FOR 3 YEARS.

Sir/Sirs



**STATUS REPORT : CLOSING OF PUBLIC PLACES ERVEN 6846 AND 6852 AS WELL AS
CLOSING OF PORTIONS OF PUBLIC STREET ADJOINING ERVEN 6784, 8949 TO 8951 AND
8968 STELLENBOSCH**

- The proposed closure of land as shown on my attached plan IN PINK, PURPLE, ORANGE, GREEN, YELLOW AND BLUE represents: PINK AND PURPLE – PORTION OF ERF 6846 AS SHOWN ON GENERAL PLAN NO. TP 7873, CLOETESVILLE TOWNSHIP, ORANGE – PORTION OF 8937 AS SHOWN ON GENERAL PLAN NO. 11678, GREEN AND YELLOW – ERF 6852, BLUE – PORTION OF ERF 6851 AND ERVEN 6667, 8932, 9527 STELLENBOSCH
It is shown as PINK, GREEN - PUBLIC PLACE, PURPLE, ORANGE – PUBLIC STREET AND YELLOW AND BLUE – ORDINARY ERF in my records.
- FOR OFFICE USE The following properties will be endorsed: GENERAL PLAN NO. TP 7873, 11359, 11678 AS WELL AS ERVEN 6852, 8932, 9527 AND 12188 STELLENBOSCH
- Endorsement fees amount to: R 830.00
- I require a copy of a diagram suitable for registration purposes, surveyed by a land surveyor, of the following: THE RELAYOUT (BORDERED BLACK ON PLAN A) AND THE PORTION IN ORANGE TO BE CLOSED (ON PLAN B)
- A written consent (accompanied by a sketch) is required in terms of Section 30(1) of Ordinance 15/1985 and Section 37(2) of the Land Survey Act 8/1997 for the amendment of: GENERAL PLAN NO. 11678 (ORANGE) AND TP 7873, CLOETESVILLE TOWNSHIP (BORDERED BLACK)

FOR OFFICE USE

Yours faithfully

PW HUNT
For SURVEYOR-GENERAL : CAPE TOWN

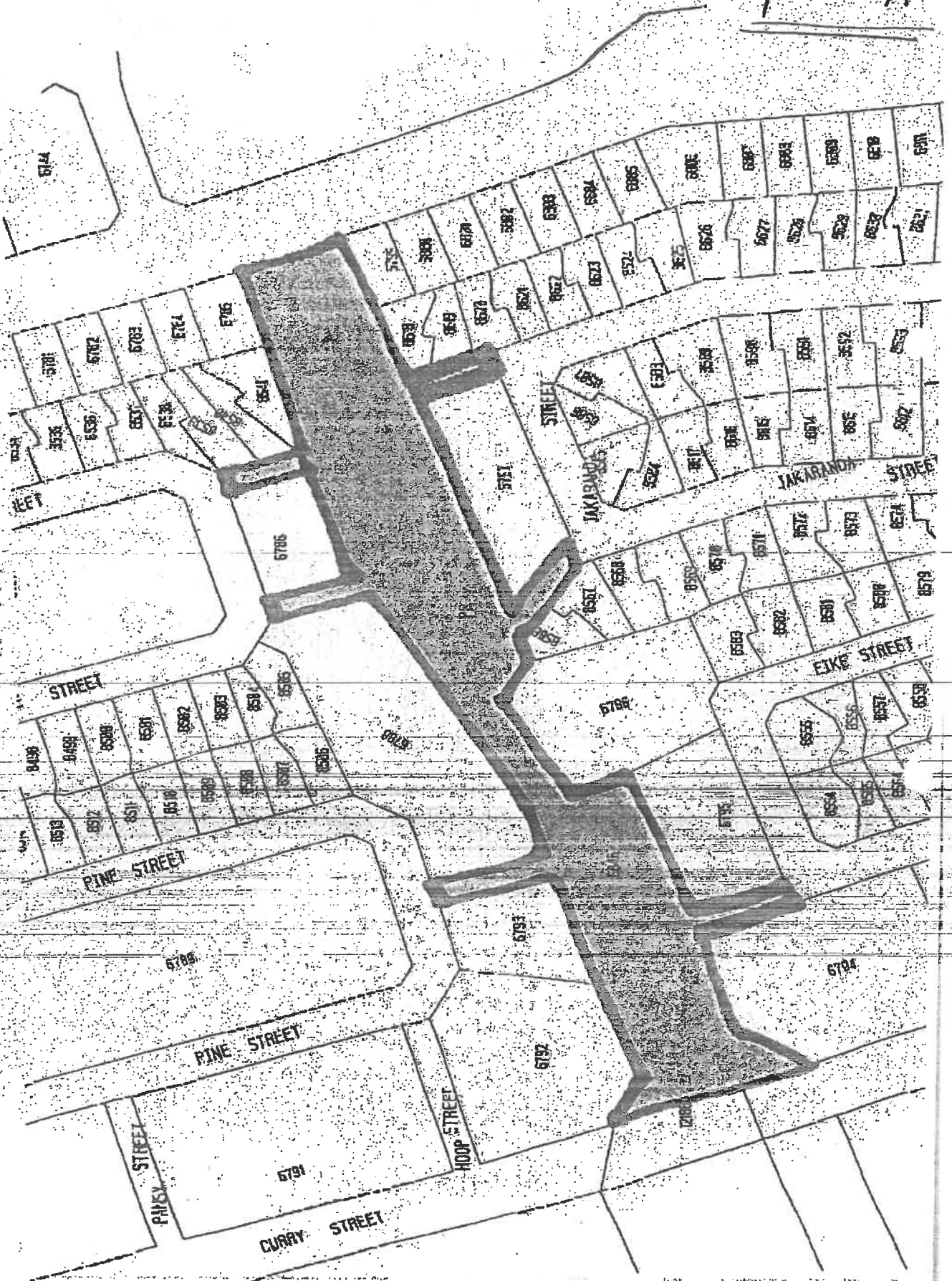


CERTIFICATE p
GAZETTE No
DATED p

SEE REVERSE SIDE
EXAMPLE A AND C

Be.
14/6

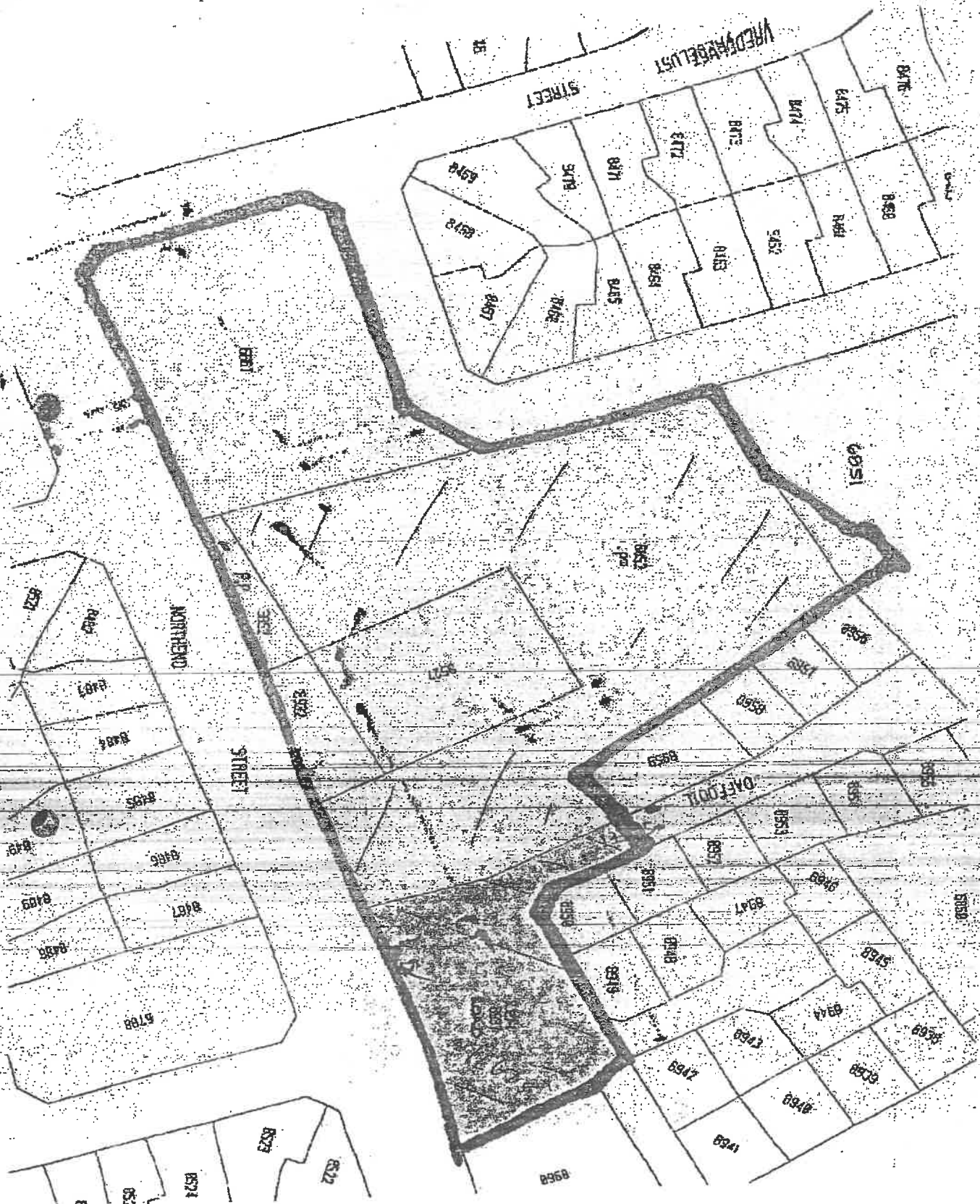
PLAN A



FAX NO. :

Chel. S
Apr. 22 2004 8:53AM

PLAN B



Friedlaender, Burger & Volkmann - Land Surveyors

SIDES Metres		ANGLES OF DIRECTION	CO-ORDINATES System WG 19°				S.G. No.
		Constants :	Y		X		
			0,00		0,00		Approved.
AB	17,53	297 00 10	A +	13492,19	+	3754277,37	for Surveyor - General Date :
BC	70,85	251 06 30	B +	13476,57	+	3754285,33	
CD	34,28	164 44 40	C +	13409,54	+	3754262,39	SHEET 2 OF 3 SHEETS
DE	6,30	254 43 40	D +	13418,56	+	3754229,32	
EF	33,86	344 45 40	E +	13412,48	+	3754227,66	
FG	17,27	251 06 50	F +	13403,58	+	3754260,33	
GH	83,65	238 38 10	G +	13387,24	+	3754254,74	
HJ	26,87	164 44 40	H +	13315,81	+	3754211,20	
JK	6,30	254 43 40	J +	13322,88	+	3754185,28	
KL	25,04	344 44 30	K +	13316,80	+	3754183,62	
LM	6,34	238 37 00	L +	13310,21	+	3754207,78	
MN	31,69	254 44 20	M +	13304,80	+	3754204,48	
NP	23,28	164 45 30	N +	13274,23	+	3754196,14	
PQ	6,30	254 43 40	P +	13280,35	+	3754173,68	
QR	23,29	344 44 30	Q +	13274,27	+	3754172,02	
RS	63,70	254 45 20	R +	13268,14	+	3754194,49	
ST	31,48	341 08 00	S +	13206,68	+	3754177,74	
TU	50,39	71 08 10	T +	13196,50	+	3754207,53	
UV	25,19	341 10 10	U +	13244,18	+	3754223,82	
VW	6,30	71 11 30	V +	13236,05	+	3754247,66	
WX	25,18	161 08 30	W +	13242,01	+	3754249,69	
XY	77,59	71 08 20	X +	13250,15	+	3754225,86	
YZ	29,71	309 07 40	Y +	13323,57	+	3754250,94	
ZA	7,43	71 04 40	Z +	13300,52	+	3754269,69	
A1B1	29,70	129 10 00	A1 +	13307,55	+	3754272,10	
B1C1	10,00	71 08 50	B1 +	13330,58	+	3754253,34	
C1D1	15,47	119 37 50	C1 +	13340,04	+	3754256,57	
D1E1	34,62	58 38 00	D1 +	13353,49	+	3754248,92	
E1F1	18,26	341 07 10	E1 +	13383,05	+	3754266,94	
F1G1	50,37	71 07 50	F1 +	13377,14	+	3754284,22	
G1H1	28,35	341 08 20	G1 +	13424,80	+	3754300,51	
H1J1	6,31	71 13 10	H1 +	13415,62	+	3754327,33	
J1K1	28,33	161 08 10	J1 +	13421,59	+	3754329,36	
K1L1	34,64	71 07 10	K1 +	13430,75	+	3754302,55	
L1M1	22,25	26 08 20	L1 +	13463,53	+	3754313,76	
M1A	59,43	161 29 50	M1 +	13473,33	+	3754333,73	

142 STEL 9	Δ	+	8616,92	+	3748445,46
405 AARNES	Δ	+	9183,09	+	3760305,20

ERF 15095 STELLENBOSCH

Administrative District of Stellenbosch

Surveyed in
by me

SCALE 1 : 2000

PLS 0907 MB Straughan Pr Land Surveyor

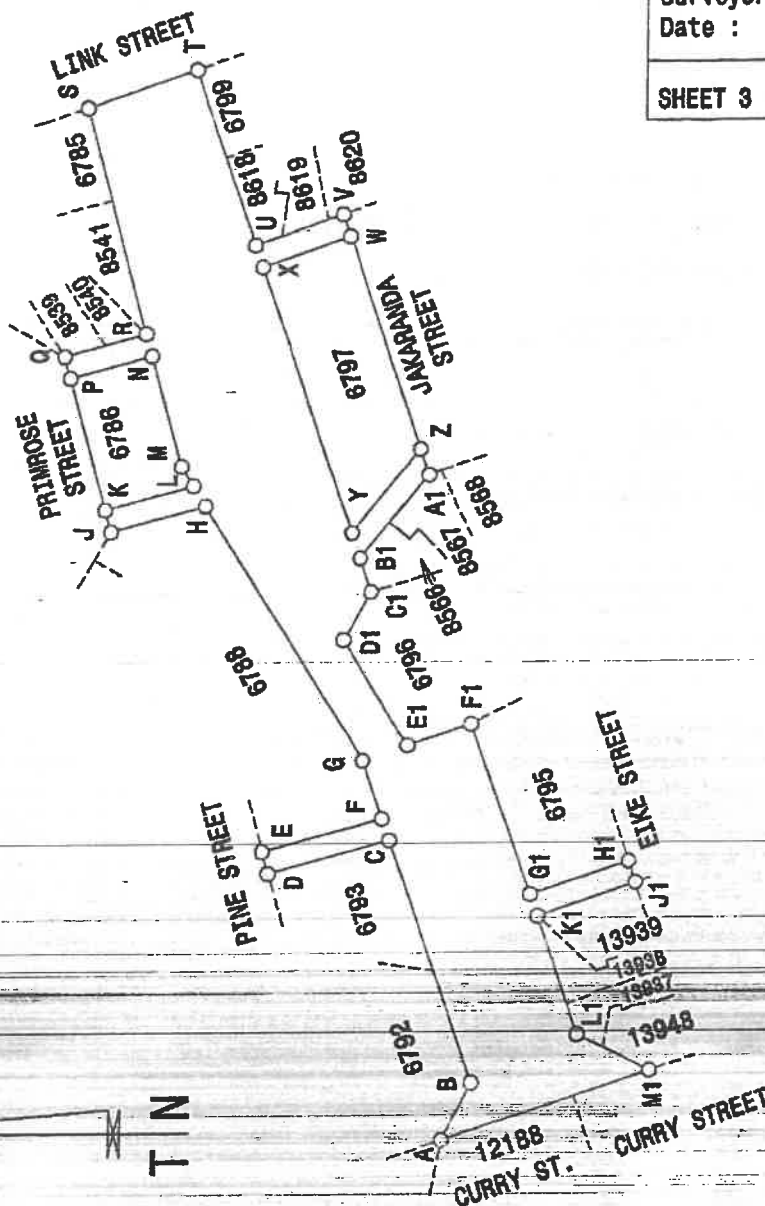
Friedlaender, Burger & Volkmann - Land Surveyors

S.G. No.

Approved.

for
Surveyor - General
Date :

SHEET 3 OF 3 SHEETS



ERF 15095 STELLENBOSCH

Administrative District of Stellenbosch

Surveyed in
by me

SCALE 1 : 2000

PLS 0907 MB Straughan Pr Land Surveyor

Navrae / Enquiries
U verwysing / Your ref.
Ons verwysing / Our Ref.
Datum / Date
Telefoon / Telephone
Faks / Fax
E-pos / E-mail

F M van Wyk
Stel.81 p.2004
Erf 6846
2004-11-18
021-808 8655
021-808 8651
johlenes@stellenbosch.org

The Surveyor-General : Cape Town
Private Bag X 9028
CAPE TOWN
8000

Sir

STATUS REPORT : CLOSING OF PUBLIC PLACES : ERVEN 6846 AND 6852 AS WELL AS CLOSING OF PORTIONS OF PUBLIC STREET ADJOINING ERVEN 6784, 8949 TO 8951 AND 8968, STELLENBOSCH

With reference to your letter dated 2004-05-12, I attach, for your information, a copy of a diagram surveyed by Friedlaender, Burger and Volkmann, Land Surveyors and a cheque for the amount of R830-00, being the endorsement fees.

Consent is hereby given to the amendment of General Plan No. TP 7873 in terms of Section 30(1) of Ordinance 15 of 1985 and Section 37(2) of the Land Survey Act 8 of 1997 by the creation of the portion of road and public place erf 6846, to be closed as one additional erf as shown bordered black on the **attached plan A**.

Your early attention to this matter will be appreciated.

Yours faithfully


for DIRECTOR : PLANNING AND ECONOMIC DEVELOPMENT SERVICES



**Western Cape
Government**

Head of Department: Environmental Affairs and Development Planning
Gerhard Gerbei

Enquiries in terms of Circular DEA&DP No. 0011/2022:
Kobus Munro (021) 483 4796 Kobus.Munro@westerncape.gov.za
Theo Rebel (021) 483 8375 Theo.Rebel@westerncape.gov.za

Reference number: 15/2 & 15/3/1/11/3

CIRCULAR: DEA&DP 0011/2022

To the Executive Mayors, Municipal Managers, Municipal Planning Heads Municipal Planners, and Planning Consultants in the Western Cape; South African Association of Consulting Professional Planners, Southern Region; SALGA (Western Cape); National Department of Agriculture, Land Reform and Rural Development; and provincial sectoral departments - Transport and Public Works, Human Settlements, Education and Local Government

Dear Sir/Madam/Ms

MINISTERIAL EXEMPTION TO ALL WESTERN CAPE MUNICIPALITIES FROM CERTAIN PROVISIONS OF THE WESTERN CAPE LAND USE PLANNING ACT, 2014 (ACT 3 OF 2014) IN TERMS OF SECTION 60(1) THEREOF

1. Purpose

1.1. The purpose of this Circular and the attached Provincial Notice is to inform all municipalities:-

1.1.1. that the Minister of Local Government, Environmental Affairs and Development Planning has granted all Western Cape municipalities an exemption from a number of provisions of the Western Cape Land Use Planning Act, 2014 (Act 3 of 2014) ("LUPA") in terms of section 60(1) thereof; and

1.1.2. of the implications of the exemption.

1.2. All Western Cape municipalities are now exempted from certain provisions in Chapter IV of LUPA, as set out in detail in the attached Provincial Notice.

2. Background

2.1. LUPA, as provincial framework legislation, regulates certain aspects of municipal planning and includes several minimum requirements, which a municipality has to abide by, such as the publication and serving of notices of the intention to consider certain land use applications.

2.2. LUPA also recognises that there are instances where an exemption or a deviation from its provisions may be desirable and justifiable.

2.3. Section 60(1) of LUPA provides that the Provincial Minister may, by notice in the *Provincial Gazette*, exempt a municipality from a provision referred to in Chapter III or IV to reduce the financial or administrative burden of integrated application processes contemplated in section 67 of LUPA, the provision of housing with assistance of a state subsidy or the incremental upgrading of existing settlements.

2.4. The Department continuously investigates ways to reduce red tape and shorten application procedures, as well as to reduce the administrative burden on all parties involved in the development

of land. One of the most effective ways to achieve this, is to enable the integration of different legislative processes as contemplated in section 67 of LUPA. However, to ensure the complete integration of processes, exemptions from certain provisions of LUPA are necessary.

- 2.5. The Department encourages the parties involved in land use applications to integrate processes and to avoid duplication. The exemption granted will facilitate more efficient, cost-effective and timeous public participation. It enables municipalities to regard public participation processes in terms of land use planning and other legislation (such as the National Environmental Management Act, 1998 (Act 107 of 1998) ("NEMA")), as sufficient for the purposes of the municipality's public participation process in terms of LUPA, without falling short of certain minimum requirements.
- 2.6. Public participation is an important requirement, and the aim of the exemption is not to exempt any party from the requirements relating to public participation *per se*, but merely to ensure public participation can be done more efficiently, timeously and cost-effectively.

3. Relevant minimum requirement in legislation

- 3.1. In addition to a land use approval from a municipality in terms of SPLUMA, LUPA and a municipality's land use planning By-law, a proposed development may also require an environmental authorisation in terms of NEMA, or an approval in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999). Other legislation may also require an approval before development may proceed in a specific instance.
- 3.2. In most instances, the processes in terms of other legislation also include a public participation process. For a development that requires various approvals it is quite possible that multiple public participation processes have to be conducted in terms of the different pieces of legislation that apply to that proposed development. The different applications are often processed sequentially, resulting in duplicate processes that are time consuming and costly, often taking more than five years to complete.
- 3.3. In *Maccsand (Pty) Ltd v City of Cape Town and Others* 2012 (4) SA 181 (CC), the Constitutional Court found that "[t]he Constitution allocates powers to three spheres of government in accordance with the functional vision of what is appropriate to each sphere. But because these powers are not contained in hermetically sealed compartments, sometimes the exercise of powers by two spheres may result in an overlap. When this happens, neither sphere is intruding into the functional area of another. Each sphere would be exercising power within its own competence. It is in this context that the Constitution obliges these spheres of government to cooperate with one another in mutual trust and good faith, and to co-ordinate actions taken with one another" (par [47], footnotes omitted).
- 3.4. The Department has issued Circular DEA&DP 0026/2020 to advise municipalities on considerations for the integration and alignment of development planning applications and decision-making.
- 3.5. Whilst the Department actively promotes the integration of processes required by the various pieces of legislation, it is now possible to implement these integrated processes without falling short of (and being in non-compliance with) some of the procedural requirements set out in LUPA.
- 3.6. The exemption now enables municipalities to use an integrated process, whilst still complying with all the relevant legislation (e.g. LUPA, SPLUMA, the relevant By-law, NEMA, etc.).
- 3.7. Even though the legislation already provides for, and promotes the integration of application processes, the Department continues to encourage such integration, as illustrated by the proactive

granting of an exemption from certain provisions of LUPA to reduce the financial or administrative burden of (a) integrated application processes contemplated in section 67, (b) the provision of housing with the assistance of a state subsidy, or (c) the incremental upgrading of existing settlements.

- 3.8. Section 29(1) of SPLUMA requires municipalities to consult an organ of state responsible for administering legislation relating to any aspect of an activity that also requires approval in terms of SPLUMA, to coordinate activities and give effect to the respective requirements of such legislation, and to avoid duplication.
- 3.9. Section 29(2) of SPLUMA provides that a municipality may enter into a written agreement with such organ of state, to avoid the duplication of the submission of information or the carrying out of a process relating to any aspect of an activity that also requires authorisation under SPLUMA. Section 29(3) of SPLUMA provides that a municipality (through its Municipal Planning Tribunal) may take account of any process authorised under the legislation covered by the above-mentioned agreement, as adequate for meeting the requirements of SPLUMA.
- 3.10. Section 67(5) of LUPA provides that a municipality or the Head of Department may decide on an application that also requires approval in terms of other legislation on the basis of a process prescribed under that legislation, but only if that process meets the requirements of the applicable by-laws and this Act. The underlined part is, however, an obstacle since various provisions in LUPA require the publication and serving of notices.
- 3.11. The provisions of section 60(1) of LUPA have now been utilised to enable the implementation of integrated processes, by granting exemptions from those provisions in LUPA that result in the duplication of processes or submission of information. The following minimum requirements in LUPA are problematic in respect of integrated processes: section 43 of LUPA requires the publication of notices regarding a municipality's intention to consider certain land use applications (public notification), section 44 of LUPA requires the serving of notices regarding a municipality's intention to consider certain land use applications (direct notification), and section 45(1) of LUPA requires municipalities to refer certain land use applications to the Head of Department for written provincial comment.
- 3.12. An exemption in terms of section 60(1) of LUPA is limited to provisions in Chapters III and IV of LUPA. As a result, the Minister could not grant an exemption relating to provisions in other Chapters of LUPA that deal with the specific requirements relating to certain types of land use applications.
- 3.13. The provisions in Chapter III of LUPA are not relevant, as Chapter III focusses on spatial planning and spatial development frameworks.
- 3.14. In order for the exemption from the provisions of sections 43 and 44 of LUPA to be effective, it was also necessary to grant an exemption from the following provisions:
 - 3.14.1. section 35(2), which deals with rezoning, on a municipality's own initiative, of land of which the municipality is not the owner, but only in so far as it refers to sections 43 and 44;
 - 3.14.2. section 39(2), which deals with applications for the removal, suspension or amendment of restrictive conditions, but only in so far as it refers to section 44;
 - 3.14.3. section 39(3), which deals with the removal, suspension or amendment of restrictive conditions on a municipality's own initiative, but only in so far as it refers to sections 43; and
 - 3.14.4. section 41(1), which deals with the amendment or waiver of a condition of approval, or the imposition of additional conditions of approval, on a municipality's own initiative or on application, but only in so far as it refers to sections 44.

- 3.15. The exemption was granted on condition that a public participation process concerning the same land use matter has been followed in terms of land use planning or other applicable legislation.

4. Notice and comment

- 4.1. Although Section 60(1) does not prescribe any particular process to be followed, the Department consulted the public and the industry regarding the intention to grant the exemption and to invite them to submit representation or objections.
- 4.2. On 02 June 2022, the Department issued Circular DEA&DP 0004/2022 that included a copy of the notice of intent, to advise of the Minister's intention of exempt municipalities from certain provisions in LUPA. The 30-day period for the submission of comments ended on 4 July 2022.
- 4.3. Since no convincing arguments that justified a reconsideration of the proposed exemption were submitted, the Provincial Minister granted all Western Cape municipalities an exemption from certain provisions in Chapter IV of LUPA, as set out in detail in the attached Provincial Notice.

5. Implications

- 5.1. The exemption does not mean that parties involved in development applications will be relieved of their obligations relating to public participation. It merely means that if an application (e.g. an environmental authorisation application in terms of NEMA) has been subjected to public participation, a municipality is no longer obligated to notify the public again in terms of LUPA. The exemption will have the effect that the use of such other public participation process will not result in non-compliance with LUPA.
- 5.2. Most municipal land use planning By-laws include a section that is similar to section 60(1) of LUPA, but that also provide that if the Provincial Minister grants an exemption or authorisation to deviate from a provision of LUPA to a municipality in terms of section 60 of LUPA, the municipality will also be exempted from or authorised to deviate from any provision of its own By-law that corresponds to the relevant provision of LUPA. Even though the exemption has been granted, a municipality may still insist on additional public consultation if it is not satisfied that sufficient notice was given of an application – municipalities must apply their minds and are not obliged to use the exemption regardless.
- 5.3. Notwithstanding the exemption, a municipality is not obligated to grant an exemption regarding other sections of its By-law just because the Minister has granted an exemption in terms of LUPA.
- 5.4. Municipalities must still ensure that interested and affected parties have been consulted efficiently and effectively, albeit through another process. Municipalities have the discretion to decide whether they want to utilise the proposed exemption.
- 5.5. The exemption is only applicable for the isolated three instances set out in section 60(1)(a) – (c) of LUPA and does not exempt municipalities from public consultation in principle or in any other instance not provided for in section 60(1)(a) – (c) of LUPA.
- 5.6. The exemption is furthermore granted on condition that a public participation process concerning the same land use matter has been followed in terms of land use planning or other applicable legislation.
- 5.7. Section 60(6) of LUPA empowers the Minister to impose, withdraw or amend a condition of any exemption so granted.

If any further information or assistance is required in this regard, please contact Kobus Munro at (021) 483 4796 or Kobus.Munro@westerncape.gov.za or Theo Rebel at (021) 483 8375 or Theo.Rebel@westerncape.gov.za.

Yours sincerely

**Gerhard
Gerber**

Digitally signed by
Gerhard Gerber
Date: 2022.10.28
07:03:47 +02'00'

GERHARD GERBER

HEAD OF DEPARTMENT: ENVIRONMENTAL AFFAIRS AND DEVELOPMENT PLANNING

Date: 28 October 2022



Western Cape Government • Wes-Kaapse Regering • URhulumente weNtshona Koloni

PROVINCE OF THE WESTERN CAPE

PROVINSIE WES-KAAP

IPHONDO LENTSHONA KOLONI

**Provincial Gazette
Extraordinary**

**Buitengewone
Provinsiale Koerant**

**Isongezelelo
kwiGazethi yePhondo**

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Thursday, 27 October 2022

Donderdag, 27 Oktober 2022

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CONTENTS

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Provincial Notice

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Esi saziso silandelayo sipapashelwe ukunika ulwazi ngokubanzi:

120 Department of Environmental Affairs and Development Planning: Western Cape Land Use Planning Act, 2014 (Act 3 of 2014): Notice of Exemption to Municipalities under Section 60(1) of Western Cape Land Use Planning Act, 2014..... 2

120 Departement van Omgewingsake en Ontwikkelingsbeplanning: Wes-Kaapse Wet op Grondgebruikbeplanning, 2014 (Wet 3 van 2014): Kennisgewing van Vrystelling aan Munisipaliteite kragtens Artikel 60(1) van Wes-Kaapse Wet op Grondgebruikbeplanning, 2014..... 4

120 ISebe leMicimbi yokuSingqongileyo noCwangciso loPhuhliso: UMthetho woCwangciso loSetyenziso loMhlaba weNtshona Koloni, 2014 (uMthetho 3 ka-2014): IsaZiso soxoLelo looMasipala Phantsi kweCandelo 60(1) loMthetho woCwangciso loSetyenziso loMhlaba weNtshona Koloni, 2014..... 6

PROVINCIAL NOTICE

The following Provincial Notice is published for general information.

DR HC MALILA,
DIRECTOR-GENERAL

Provincial Legislature Building,
Wale Street,
Cape Town.

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Provinsiale Wetgewer-gebou,
Waalstraat,
Kaapstad.

ISAZISO SEPHONDO

Esi saziso silandelayo sipapashelwe ukunika ulwazi ngokubanzi.

GQIR HC MALILA,
MLAWULI-JIKELELE

ISakhiwo sePhondo,
Wale Street,
eKapa.

PROVINCIAL NOTICE

P.N. 120/2022

27 October 2022

**DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND DEVELOPMENT PLANNING
WESTERN CAPE LAND USE PLANNING ACT, 2014 (ACT 3 OF 2014)
NOTICE OF EXEMPTION TO MUNICIPALITIES UNDER SECTION 60(1) OF
WESTERN CAPE LAND USE PLANNING ACT, 2014**

I, Anton Wilhelm Bredell, Provincial Minister of Local Government, Environmental Affairs and Development Planning in the Western Cape, under section 60(1) of the Western Cape Land Use Planning Act, 2014 (Act 3 of 2014) (LUPA), grant an exemption to all municipalities in the Western Cape from the provisions of LUPA as set out in the Schedule. The exemption is aimed at reducing the financial or administrative burden of integrated application processes contemplated in section 67 of LUPA, the provision of housing with the assistance of a state subsidy and the incremental upgrading of existing settlements. The exemption is granted on condition that a public participation process concerning the same land use matter has been followed in terms of land use planning or other applicable legislation.

Signed at Cape Town on this 11th day of October 2022.

AW BREDELL

**PROVINCIAL MINISTER OF LOCAL GOVERNMENT, ENVIRONMENTAL
AFFAIRS AND DEVELOPMENT PLANNING**

SCHEDULE

Section of LUPA	Brief description	Extent of exemption
Section 43	Publication of notices regarding a municipality's intention to consider certain land use applications	The whole
Section 44	Serving of notices regarding a municipality's intention to consider certain land use applications	The whole
Section 45(1)	Referral by municipalities of certain land use applications to the Head of Department for written provincial comment	The whole
Section 35(2)	Rezoning, on a municipality's own initiative, of land of which the municipality is not the owner	Only in so far as it refers to sections 43 and 44
Section 39(2)	Serving of notices regarding applications for the removal, suspension or amendment of restrictive conditions	Only in so far as it refers to section 44
Section 39(3)	Removal, suspension or amendment of restrictive conditions on a municipality's own initiative	Only in so far as it refers to section 43
Section 41(1)	Amendment or waiver of a condition of approval, or the imposition of additional conditions of approval, on a municipality's own initiative or on application	Only in so far as it refers to section 44

P.K. 120/2022

PROVINSIALE KENNISGEWING

27 Oktober 20.

**DEPARTEMENT VAN OMGEWINGSAKE EN ONTWIKKELINGSBEPLANNING
WES-KAAPSE WET OP GRONDGEBRUIKBEPLANNING, 2014 (WET 3 VAN 2014)
KENNISGEWING VAN VRYSTELLING AAN MUNISIPALITEITE Kragtens
ARTIKEL 60(1) VAN WES-KAAPSE WET OP GRONDGEBRUIKBEPLANNING, 2014**

Ek, Anton Wilhelm Bredell, Provinsiale Minister van Plaaslike Regering, Omgewingsake en Ontwikkelingsbeplanning in die Wes-Kaap, verleen kragtens artikel 60(1) van die Wes-Kaapse Wet op Grondgebruikbeplanning, 2014 (Wet 3 van 2014) (LUPA), aan alle munisipaliteite in die Wes-Kaap vrystelling van die bepalings van LUPA soos in die Bylae uiteengesit. Die vrystelling is gemik op die verligting van die finansiële of administratiewe las van geïntegreerde aansoekprosesse beoog in artikel 67 van LUPA, die verskaffing van behuising met behulp van 'n staatsubsidie of die stapsgewyse opgradering van bestaande nedersettings. Die vrystelling word verleen op voorwaarde dat 'n openbaredeelnamesproses oor dieselfde grondgebruikaan- geleentheid gevolg word ingevolge grondgebruikbeplannings- of ander wetgewing wat van toepassing is.

Geteken te Kaapstad op hierdie 11de dag van Oktober 2022.

AW BREDELL

**PROVINSIALE MINISTER VAN PLAASLIKE REGERING, OMGEWINGSAKE EN
ONTWIKKELINGSBEPLANNING**

BYLAE

Artikel van LUPA	Kort beskrywing	Omvang van vrystelling
Artikel 43	Publikasie van kennisgewings rakende 'n munisipaliteit se voorneme om sekere grondgebruikaansoeke te oorweeg	Die geheel
Artikel 44	Betekening van kennisgewings rakende 'n munisipaliteit se voorneme om sekere grondgebruikaansoeke te oorweeg	Die geheel
Artikel 45(1)	Verwysing deur munisipaliteite van sekere grondgebruikaansoeke na die Departementshoof vir skriftelike provinsiale kommentaar	Die geheel
Artikel 35(2)	Hersonering, uit eie beweging deur 'n munisipaliteit, van grond waarvan die munisipaliteit nie die eienaar is nie	Slegs vir sover dit na artikels 43 en 44 verwys

Artikel van LUPA	Kort beskrywing	Omvang van vrystelling
Artikel 39(2)	Betekening van kennisgewings rakende aansoeke vir die opheffing, opskorting of wysiging van beperkende voorwaardes	Slegs vir sover dit na artikel 44 verwys
Artikel 39(3)	Opheffing, opskorting of wysiging van beperkende voorwaardes uit eie beweging deur 'n munisipaliteit	Slegs vir sover dit na artikel 43 verwys
Artikel 41(1)	Wysiging of kwytskelding van 'n voorwaarde van goedkeuring, of die oplegging van bykomende voorwaardes van goedkeuring, uit eie beweging deur 'n munisipaliteit of op aansoek	Slegs vir sover dit na artikel 44 verwys

ISAZISO SEPHONDO

I.S. 120/2022

27 kweyeDwarha 2022

**ISEBE LEMICIMBI YOKUSINGQONGILEYO NOCWANGCISO LOPHUHLISO
UMTHETHO WOCWANGCISO LOSETYENZISO LOMHLABA WENTSHONA
KOLONI, 2014 (UMTHETHO 3 KA-2014)
ISAZISO SOXOLELO LOOMASIPALA PHANTSI KWECANDELO 60(1)
LOMTHETHO WOCWANGCISO LOSETYENZISO LOMHLABA WENTSHONA
KOLONI, 2014**

Mna, Anton Wilhelm Bredell, uMphathiswa woRhulumente weNgingqi, iMicimbi yokuSingqongileyo noCwangciso loPhuhliso kwiNtshona Koloni, phantsi kwecandelo 60(1) loMthetho woCwangciso loSetyenziso loMhlaba weNtshona Koloni, 2014 (uMthetho 3 ka-2014) (iLUPA), ndinika uxolelo kubo bonke oomasipala abakwiNtshona Koloni ekuthobeleni imimiselo ngokwemigaqo yeLUPA njengoko kumiselwe kwiShedyuli. Oku kukhulula ekuthobeleni imimiselo kujoliswe ekunciphiseni umthwalo ngokwezemali nangokwezolawulo kwinkalo yeenkqubo zezicelo ezihlanganyelweyo njengoko kumiselwe kwecandelo 67 leLUPA, ukunikezelwa kwezindlu ngoncedo lwenkxasomali yombuso kwanokuphuculwa ngokuthi kwenyuswe kweengingqi zokuhlala esezikho. Oku kukhululwa ekuthobebeleni imimiselo kunikezelwa phantsi komqathango wokuba maze kulandelwe inkqubo yokubonisana noluntu ngokubanzi kwamalunga nalo mba ungokusetyenziswa komhlaba ngokwemigaqo yemithetho yocwangciso lokusetyenziswa komhlaba okanye ngokwemigaqo yeminye imithetho echaphazelekayo.

Sityikitywe eKapa ngomhla we-11 kweyeDwarha ka-2022.

AW BREDELL

**UMPHATHISWA WEPHONDO WORHULUMENTE WENGINQI, IMICIMBI
YOKUSINGQONGILEYO NOCWANGCISO LOPHUHLISO**

ISHEDYULI

ICandelo leLUPA	Ingcaciso emfutshane	Ubungakanani bokuvulelwa
ICandelo 43	Ukupapashwa kwezaziso ezimalunga nomnqweno kamasipala wokuqwalasela izicelo ezithile zokusetyenziswa komhlaba	Ngokukonke
ICandelo 44	Ukunikezelwa kwezaziso ezimalunga nomnqweno kamasipala wokuqwalasela izicelo ezithile zokusetyenziswa komhlaba	Ngokukonke
ICandelo 45(1)	Ukudluliselwa kwezicelo ezithile zokusetyenziswa komhlaba ngoomasipala kwiNtloko yeSebe ukuze kufumaneka uluvo lwephondo olupbhalwe phantsi	Ngokukonke
ICandelo 35(2)	Ukwahlulahlulwa, ngokokuthanda kukamasipala, komhlaba ongengowaloo masipala	Apho uchaphazela khona amacandelo 43

ICandelo leLUPA	Ingcaciso emfutshane	Ubungakanani bokuvulelwa
		no44 kuphela
ICandelo 39(2)	Ukunikezelwa kwezaziso ezimalunga nezicelo zokususwa, ukunqunyanyiswa okanye ezokwenziwa kwezilungiso ezingemigaqo yezithintelo	Apho uchaphazela khona icandelo 44 kuphela
ICandelo 39(3)	Ukususwa, ukunqunyanyiswa okanye ukwenziwa kwezilungiso kwimiqathango yezithintelo ngokokuthanda kwaloo masipala	Apho uchaphazela khona icandelo 43 kuphela
ICandelo 41(1)	Ukwenziwa kwezilungiso okanye ukususwa komqathango wokuphumeza, okanye ukumiselwa kwemiqathango eyongezelelekileyo, ngokokuthanda kwaloo masipala okanye kwisicelo	Apho uchaphazela khona icandelo 44 kuphela



**APPLICATION FOR REZONING, SUBDIVISION, DEPARTURE, CONSENT USE AND
 CLOSURE OF A PUBLIC PLACE: ERF 7001, STELLENBOSCH.**

CONTENT	
ANNEXURES	PAGE NUMBER
ANNEXURE A: Locality Plan	150 – 151
ANNEXURE B: Zoning and Subdivision Plan and Telecommunication Base Station Plans	152 - 158
ANNEXURE C: Applicants Motivation	159 - 653
ANNEXURE D: Portfolio of Evidence	654 - 789
ANNEXURE E: Comments from Heritage Western Cape	790 - 791
ANNEXURE F: Comments from Infrastructure Services	792 - 798
ANNEXURE G: Comments from Electrical Engineering	799 - 800
ANNEXURE H: Comments from Community Services	801 - 802
ANNEXURE I: Comments from Spatial Planning	803 - 806



STELLENBOSCH

STELLENBOSCH • PNIEL • FRANSCHHOEK

MUNISIPALITEIT • UMASIPALA • MUNICIPALITY

DIRECTORATE: PLANNING & ECONOMIC DEVELOPMENT DEVELOPMENT MANAGEMENT: LAND USE MANAGEMENT

PLANNING REPORT ON APPLICATION IN TERMS OF SECTION 15(2) OF THE STELLENBOSCH MUNICIPAL LAND USE PLANNING BYLAW

APPLICATION DETAILS

Application Reference	LU/16572	Commencement Date	2024/01/23
Applicant	Rudolf Schroder of Zutari (Pty) Ltd on behalf of Stellenbosch Municipality	Last day for comments or additional information	2024/10/04
Erf/Farm Nr	Erf 7001	Place	Stellenbosch
Zoning	Public Open Space	Other approvals	None

X TYPE OF APPLICATION

X	15(2)(a) rezoning of land*
X	15(2)(b) a permanent departure from the development parameters of the zoning scheme
	15(2)(c) a departure granted on a temporary basis to utilize land for a purpose not permitted in terms of the primary rights of the zoning applicable to the land
X	15(2)(d) a subdivision of land that is not exempted in terms of section 24, including the registration of a servitude or lease agreement*
	15(2)(e) a consolidation of land that is not exempted in terms of section 24*
	15(2)(f) a removal, suspension or amendment of restrictive conditions in respect of a land unit*
	15(2)(g) a permission required in terms of the zoning scheme
	15(2)(h) an amendment, deletion or imposition of conditions in respect of an existing approval*
	15(2)(i) an extension of the validity period of an approval
	15(2)(j) an approval of an overlay zone as contemplated in the zoning scheme
	15(2)(k) an amendment or cancellation of an approved subdivision plan or part thereof, including a general plan or diagram*
	15(2)(l) a permission required in terms of a condition of approval
	15(2)(m) a determination of a zoning
X	15(2)(n) a closure of a public place or part thereof
X	15(2)(o) a consent use contemplated in the zoning scheme
	15(2)(p) to disestablish a homeowners' association
	15(2)(q) to rectify a failure by a homeowners' association to meet its obligations in respect of the control over or maintenance of services
	15(2)(r) a permission required for the reconstruction of an existing building that constitutes a non-conforming use that is destroyed or damaged to the extent that it is necessary to demolish a substantial part of the building
	Approval required in terms of relevant policy for street naming and numbering
	Approval required in terms of Council policies or by-laws – Specify:

Consent / Permission required in terms of a title deed (includes where planning permission is required in terms of the Advertising on Roads and Ribbon Development Act, Act 21 of 1940)

NATURE AND SCOPE OF PROPOSED LAND USE APPLICATION

Erf 7001, Stellenbosch is a 6.5341 ha, predominantly vacant public open space with 0.65ha been taken up by a municipal utility services site and the rest use as a public park (See **APPENDIX A** for locality plan). The property's zoning has been confirmed as Public Open Space Zone, hence the application for closure of a public space, rezoning to also regularise the utility services site, create a subdivisional site, and subdivision for the establishment of the individual development erven. The development will consist of 1 utility service site, 5 public open spaces, 201 residential sites and 1 public road erf (See **APPENDIX B**).

The Stellenbosch Municipality identified a need for an integrated urban settlement development to address the municipal housing backlog in Cloetesville. Erf 7001, Cloetesville was identified as a suitable site for such a development. The project aims to facilitate a sustainable integrated development specifically earmarked for medium to upper market housing units (GAP) to address housing needs in Cloetesville and surrounding areas, to ensure the social and economic sustainability of the inhabitants of Cloetesville.

There is therefore an urgent need for the subject Property (Erf 7001, Cloetesville) to be developed for residential purposes to create an integrated urban environment, providing different housing typologies together with appropriate economic opportunities. This will be achieved with due consideration of the particular residential environment within which the project is located, as well as with the optimum development potential of the subject property in mind.

Consideration are given to put in place Architectural Guidelines to control the architectural and environmental characteristics of the proposed project on Erf 7001. This will be a separate exercise as part of the final call for proposal process, to ensure the development compliments its immediate residential environment. The intend is therefore to establish a collective architectural identity that will set a standard for a quality lifestyle and protect homeowner's property investment. Further to ensure the promotion a qualitative development, to be known for its own charm, beauty and ultimately, its own unique "sense of place".

Street and side building line departure are applied for to ensure the siting of a dwelling on the propose site, will accommodate a better street interface, sufficient onsite parking and create functional backyard spaces. Placing the dwellings 1m from the street boundary will subsequently assist with keeping the street scape consistent with the developments intend and avoid insufficient extensions and alteration on the street boundaries.

The type of housing and target market that were envisaged for Erf 7001, Cloetesville is mainly focussed for those with a monthly income exceeding R7001 but not exceeding R22 000 and with an estimated house price of between R800 000 and R 1 200 000.

According to the recent Housing Market study for Intermediate Cities/ Larger Towns in the Western Cape undertaken by Department of Environmental Affairs and Development Planning, only 20.5% of Stellenbosch town households could afford to purchase a home worth approximately R1.2 million or more, with a mortgage. The proposed housing typology provide in the housing need of the people of Stellenbosch and specifically, Cloetesville who can afford GAP housing opportunities.

The applicant motivational report is attached as **APPENDIX C**.

ASSESSMENT CHECKLIST			
CONSIDERATION CRITERIA	YES	NO	Comments, if any
Accurate intergovernmental and public participation process followed	Yes		Circulated to interested and affected parties and relevant departments.
Conditions imposed by departments	Yes		All relevant conditions have been included in recommended decision.
DCs applicable		No	
Objections received	Yes		Listed in Portfolio of Evidence (See APPENDIX D)
Proposal complies with applicable laws, policies, guidelines, the IDP and SDP and/or technical requirements in terms of Section 65	Yes		The proposed use is aligned with the MSDF provision for mixed-use community and residential infill development within an urban edge.

Methods of advertising				Date published	Closing date for Objections/comments
Press (Eikestad Nuus)	Yes	N	N/A	25 January 2024	05 March 2024
Notices	Yes	N	N/A	05 February 2024	05 March 2024
On-site display	Yes	N	N/A	05 February 2024	05 March 2024
Community organisation(s)	Yes	N	N/A	05 February 2024	05 March 2024
Municipal Website	Yes	N	N/A	30 January 2024	05 March 2024
Ward Councillor	Yes	N	N/A	17 January 2023	
Internal Departments	Yes	N	N/A	17 January 2023	

DESIRABILITY CONSIDERATIONS IN TERMS OF SECTION 65 OF THE BYLAW	
Socio-economic impact	There is an urgent need for the subject Property (Erf 7001, Cloeteville) to be developed to create an integrated urban development, providing for different housing typologies together with appropriate economic opportunities in Cloeteville specifically.
Compatibility with surrounding uses	The property is surrounded by residential development and the proposed land use will not detract from its immediate residential surroundings.
Impact on the external engineering services	Budget provision must be made for the provision of adequate bulk service upgrades by the relevant municipal line departments. The application was subsequently approved by the Infrastructures Services Section, subject to certain conditions.
Impact on safety, health and wellbeing of the surrounding community	The finalization of the development will be achieved with due consideration for the particular environment within which the project is located, as well as with the optimum development potential of the subject property in mind. The partial conversion of a vacant open park will enhance the safety and wellbeing of the community, while still retaining a portion of the property for recreational purposes.
Impact on heritage	Heritage Western Cape on 31 January 2019 indicated that since there is no reason to believe that the proposed residential development, will not impact on heritage resources, no further action under Section 38 of the National heritage resources Act, is required. See APPENDIX E .

<p>Impact on the biophysical environment</p>	<p>The Department of Environmental Affairs and Development Planning, consider the site to be transformed and concluded that it no longer contains indigenous vegetation and that the proposed residential development subsequently does not constitute any listed activities as defined in terms of NEMA EIA Regulations. Environmental Authorization was therefore not required prior to the proposed development. Portions of the existing trees will subsequently be removed while $\pm 0.76\text{ha}$ ($\pm 12.8\%$ of site) will be retained for public open space purposes.</p> <p>The municipal environmental planner concurs with this assessment and outcome.</p> <p>It is therefore not envisaging that the removal of some trees on this site will lead to the extinction of a particular birth species, which in all probability will move to an alternative site or return to the remaining trees, after construction is completed. Considering that some trees will be retained on the remaining public open space portion. The environmental consequences have therefore been taken into consideration in the project design.</p> <p>While the housing need is a fundamental human right that should be secure, affordable and accessible, it should be appropriate in its location and this location has been deemed desirable by most.</p>
<p>Traffic impacts, parking, access and other transport related considerations</p>	<p>The traffic impact assessment report concluded that there is no reason for this infill housing project not to be approved.</p> <p>It recommends that;</p> <ul style="list-style-type: none"> (i) the signal phasing at the R304- Welgevonden be reviewed in light of the intersection modelling results and dualling of the road leading to the intersection. (ii) the signal phasing at the R44 – Hendricks Street be reviewed in light of the intersection modelling results and the R44 be fully dualled. (iii) convert the R44/Fir Street stop-controlled intersection into a signalised intersection. (iv) the Arterial Management plan for the R44 and R304 be reviewed in the light of the proposed signalisation of Fir Road and the R44 intersection and plans for the dualing the portion of the R44 adjacent to Cloetestville. (v) Given the growth of Cloetesville and its surrounding neighbourhoods, the dualling of the R44 will be needed in the near future. <p>The Municipal Infrastructure Services Department subsequently comments as follows;</p> <p><i>"It is recommended that the following road infrastructure projects be prioritise the next time that the municipal budget is reviewed. These projects are required to address traffic congestion due to the background traffic in the catchment area of this development:</i></p> <ul style="list-style-type: none"> <i>(a) Full dualling of the R44 between the R44/Hendrickse Street and R44/Fir Street intersection.</i> <i>(b) Signalisation of the R44 and Fir Street intersection.</i> <i>(c) Dualling of the R304 – Northbound and Southbound of the Welgevonden intersection."</i>

	All parking requirements per erf will be complied with, based on the number of bedrooms per site, as per the zoning scheme bylaw. The application for departure from the parking requirement as initially advertised, was subsequently withdrawn.
Whether the imposition of conditions can mitigate an adverse impact of the proposed use or development of land.	<p>If there is a definite need for it and it can be enforced, conditions could be imposed on a rational basis. Considering the subject housing project, conditions should be reasonable in all respects and serving a public interest.</p> <p>A condition relating to the upgrades required at the different major intersection leading from this housing project could be imposed, as long as it is not a condition for example, upgrading of a road to accommodate pre-existing traffic problems, but only due to the increase of traffic generated by this housing development.</p> <p>Spatial Planning recommendation that an Urban Design/landscape Plan be submitted to the municipality and that new trees be replanted to form part of the new development, could be imposed as a condition of approval.</p>

OBJECTIONS RECEIVED AND CORRESPONDING REPLY BY APPLICANT

Response/comments and objections has been received from 26 members of the public and 4 interested groups. See Page 21 of the Portfolio of Evidence (POE Attached as **APPENDIX D**) for the applicant's response on the comments and objections, and all comments/objections that has been received from the interested and affected parties.

Summarized responses addressing certain concerns. See above POE for full content of responses.

Concern	Response
Concerns about reduced parking bays exacerbating existing problems.	The parking departure has been withdrawn by the applicant, with the effect that all onsite parking will be provided onsite, as per the zoning scheme bylaw requirements.
Overpopulation and pressure on infrastructure.	Ample capacity is available for all civil services, given the proposed upgrades are facilitated ahead of construction. Budget provision must therefore be made by the municipal departments.
Objection to relaxation of building lines, which will lead to overcrowding, leading to pressure on roads and infrastructure.	The aim is not to increase the number of units on site but rather to optimise the layout of housing for three key purposes, spatial definition of the street, enhancing safety through surveillance and creating more liveable spaces with larger garden area.
What measures will be implemented to ensure the safety and well-being of the current and future residents.	The proposed land uses are compatible with the surrounding existing land uses and therefore, no negative impacts on safety, health and well-being of the surrounding community are anticipated.
The issue of reduction in property value.	These statements are unfounded and speculative.
Concern about the adverse effects on the existing communities' social fabric.	The target market is households earning between R7000 and R22 000 and the proposals focus extends to ensuring that the design and overall aesthetics of the housing contribute positively to the broader community landscape, enriching the public image of the area.

Concerns about increased traffic congestion and safety risks, especially in narrow streets and cul-de-sacs.	The impact on capacity and intersection operation was analysed and it was found that all the study intersections inside Cloetesville can operate at acceptable Levels of Service. All the future scenarios continue to operate at the same Levels of Service as the background traffic scenario. The traffic impact assessment makes some recommendations as to what upgrades could be considered by the municipality to improve the level of services of the surrounding road network.
The development's footprint could significantly alter the natural landscape, potentially disrupting fragile ecosystems and diminishing the area's ecological resilience.	An environmental due diligence study for Erf 7001, Cloetesville site was conducted to identify any potential environmental constraints that could impact on the developability of the site. Following the investigations, it was concluded that there are no environmental sensitive features on the site and have received confirmation from DEADP that the proposed development does not constitute any listed activities as defined in terms of the NEMA EIA Regulations 2014 (as amended) and that Environmental Authorisation is therefore not required prior to the proposed development.
Who will be responsible for the stormwater retention pond and ensuring its upkeep and addressing any potential issues that may arise.	With respect to maintenance and upkeep, Stellenbosch Municipality is mandated to ensure that all public open space features are maintained. The proposed stormwater detention pond will therefore enhance the appearance of the development and forms an integral part of the functioning of the stormwater management strategy for the development.

KEY FINDINGS OF PLANNING EVALUATION

After having independently considered and weighted all the relevant information the evaluation of the subject land use and land development application concludes that:

1. The proposed integrated property development for the GAP housing market (which is a strategic objective of the municipality, to perform its mandate) will address the housing need in Cloetesville and is in line with the MSDP considering that it will be located in an area earmarked by the MSDP for mixed-use community and residential infill development.
2. This housing project is therefore consistent with the PSDP and Municipal SDF that promotes compaction and densification within the urban edge.
3. The project forms part of the Municipality's Housing Pipeline and is incorporated in the Municipal 5-year IDP from approximately 2017 already. Clearly showing the urgent need for this development from a municipal perspective.
4. The initial housing opportunity projection for the site was between 250 to 300 units, while the final design proposed now under consideration is 201 residential opportunities, subsequently at a lower residential gross density ratio and more compatible with the surrounding residential environment.
5. The average gross residential density of approximately 30 units per hectare is consistent with the targets in the MSDP of 25 units per hectare, in order to make provision for redevelopment and densification as a means to accommodate market demand.
6. All departmental conditions of approval are reasonable, legally enforceable and could be imposed as conditions of approval should the decision-maker deem the application desirable.
7. No additional applications in terms of the environmental or heritage legislation are required, confirming the potential of the site to be developed for housing opportunities.
8. Sufficient functional public open space is provided on 0.76ha of the site, which could cater for both the existing and proposed developments recreational needs.
9. The proposed erven adjacent to cadastral boundaries of existing residential developments is either of similar sizes and width and would therefore not detract from its immediate surroundings.

10. The concerns and objections raised are adequately addressed in the motivation report, the applicant's comments on the objections, the conditions of the different departments and final layout plans submitted for consideration.
11. The proposal subsequently presents an achievable, affordable and sustainable housing solution for Cloetesville's housing crisis, and will assist in alleviating social inequalities in the broader Stellenbosch, considering that it will increase the supply in dignified housing opportunities.
12. The proposed housing development will not impact negatively on the existing peaceful residential neighborhood and will assist to creating a harmonious and livable environment for all.
13. The closure of the public place will be in the interest of the broader community and a portion will be retained for public open space purposes. The closure will regularize some of the current uses (utility Services) and will enable the various other statutory processes to realise the sites long-term potential, earmarked for infill development.
14. It is not envisaging that the health, safety and welfare of the community will be affected negatively by the proposed telecommunication base station and mast, and will rather be beneficial to the broader community and customer base, with the increase in coverage and capacity.
15. The proposals are in line with the objectives and principles of the Integrated Development Plan and the Stellenbosch Municipal Spatial Development Framework.

Conclusion:

The Cloetisville housing proposal presents a well balance integrated development, providing affordable GAP housing opportunities, balance with sufficient open space areas and accommodating existing utility services in a predominantly residential neighbourhood.

It's the municipality mandate not to discriminate against certain income groups in the provision of housing and must make it easier to access affordable housing in their own communities. The submission of objections, does not necessarily mean an application needs to be refused. The decision maker needs to balance the impact of a planning application against all the other considerations including planning policies and the reasonable expectations of the municipality to perform its mandate.

The municipal decision-maker must consider but is not bounded to a form of neighbourhood protectionism where residents or property owners may oppose the construction of certain developments, such as the proposed affordable housing projects, in their neighbourhood. The municipal bylaws do not limit the construction of affordable housing or wants to make it difficult for medium/low-income families to find a place to live. Understandably, some individuals may want to protect their neighbourhoods from potential adverse effects that new developments could bring, such as noise, traffic, or changes to the neighbourhood's character. However, it is crucial to consider that this form of neighbourhood protectionism has some downsides. It can also lead to a lack of diversity in neighbourhoods and a lack of resources for the community. Displacement of medium/low-income families also tends to occur as neighbourhoods become more upscale and expensive. Furthermore, it can limit economic growth in certain areas and make it harder for small businesses to succeed. While it's understandable that people want to protect their neighbourhood, a balance should be struck to consider the wider community's needs and ensure that the benefits of new developments are fairly distributed. This GAP housing proposal presents such a community need, notwithstanding the objections received.

The subject land use and land development application is, having regard to the conclusions above, viewed as in consistent with the relevant legislative / principles / policy / guidelines / plans and consequently grounds for the support of the subject land use and land development application.

List relevant plan numbers	Drawing Project Number 1001918, dated 04/10/2024, drawn by Zutari Impact Engineered and attached as APPENDIX B .
List annexures to decision	APPENDIX A: Locality Plan APPENDIX B: Zoning and Subdivision Plan and Telecommunication Base Station Plans APPENDIX C: Applicants Motivation APPENDIX D: Portfolio of Evidence APPENDIX E: Comments from Heritage Western Cape APPENDIX F: Comments from Infrastructure Services APPENDIX G: Comments from Electrical Engineering APPENDIX H: Comments from Community Services APPENDIX I: Comments from Spatial Planning

ASSESSMENT RECOMMENDATION BY TOWN PLANNER

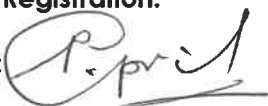
The proposed land use and land development application has been duly evaluated in terms of process and desirability with the recommendation for consideration.

Name: Pedro April

Capacity: Senior Town Planner

SACPLAN Registration:

Signature:



Date: 2024/11/12

REVIEW OF ASSESSMENT AND RECOMMENDATION

The recommendation for decision is hereby submitted for consideration to the authorised decision-maker in accordance with the System of Delegations OR Categorisation Model approved in terms of Section 69 of the said Bylaw vide Item 11.8.1 dated 24 May 2023.

Category: A5, B5, D5, N5

Decision Making Authority: MPT

Rational: Application on initiative of Council or on Council owned land.

Name:

Capacity:

Steven Coetzee
JNMM

SACPLAN Registration:

A/ISSI

Signature:

Date:


14/11/2024.

MPT ADMINISTRATION OF PLANNING APPLICATION ASSESSMENT REPORT**Administrator to Stellenbosch Municipal Planning Tribunal:**

It is hereby confirmed that proper notice was served of the Municipal Planning Tribunal meeting at which this land use and land development application will serve for consideration.

The land use and land development application will serve at the scheduled meeting of the Stellenbosch Municipal Planning Tribunal on:

Date: 29.11.2024

Name: Christine Kriel

Capacity: member

Signature: [Signature]

Date: 14.11.2024



STELLENBOSCH

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MUNISIPALITEIT • UMASIPALA • MUNICIPALITY

RECOMMENDATION:

1. That the following application(s) in terms of Section 15(2) of the Stellenbosch Municipal Land Use Planning Bylaw on Erf 7001, Stellenbosch for:
 - 1.1. In terms of Section 15(2)(n) of the said bylaw, for the closure of a part of a public place.
 - 1.2. In terms of Section 15(2)(a) of the said bylaw, for the rezoning from Public Open Space Zone to Subdivisional Area Overlay Zone in order to allow for the following uses;
 - 1.2.1 Conventional Residential Zone Erven,
 - 1.2.2 5 Public Open Space Zone Erven,
 - 1.2.3 1 Utility Services Zone Erf and
 - 1.2.4 1 Public Road and Parking Zone Erf
 - 1.3 In terms of Section 15(2)(d) of the said bylaw, for the subdivision into 208 erven, namely;
 - 1.3.1 Erf 1 to Erf 201 (Conventional Residential Zone Erven) ranging from $\pm 115\text{m}^2$ to $\pm 312\text{m}^2$ (total of $\pm 3.32\text{ha}$).
 - 1.3.2 Erf 202 ($\pm 945\text{m}^2$), Erf 203 ($\pm 548\text{m}^2$), Erf 204 ($\pm 261\text{m}^2$), Erf 205 ($\pm 5866\text{m}^2$) and Erf 206 ($\pm 8.4\text{m}^2$) zoned Public Open Space Zone;
 - 1.3.3 Erf 207 ($\pm 6506\text{m}^2$) zoned Utility Services Zone.
 - 1.3.4 Erf 208 ($\pm 17976\text{m}^2$) zoned Public Road and Parking Zone.
 - 1.3.5 The registration of a 4m wide right of way servitude over Portion 128 in favour of Portion 129.
 - 1.3.6 The registration of a 5.2m and 6.6m wide services servitude in favour of the municipality over Portion 124, 125 and 126.
 - 1.4 In terms of Section 15(2)(b) of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2023, for a permanent departure all residential zoned properties, to relax;
 - 1.4.1 the Street building line for erven up to 250m^2 from 2m to 1m,
 - 1.4.2 the Street building line for erven between 251m^2 to 500m^2 from 3m to 1m and
 - 1.4.3 the common building lines from 1m to 0m for.
 - 1.5 In terms of Section 15(2)(o) of the said bylaw, for consent use to erect a telecommunications mast on the portion to be zoned as Public Open Space Zone (Portion 205).

BE APPROVED in terms of Section 60 of the said Bylaw and subject to conditions of approval.

- 2 The approval is subject to the following **conditions** imposed in terms of Section 66 of the said Bylaw:
 - 2.3 The approval only applies to the proposed applications under consideration and shall not be construed as authority to depart from any other legal prescriptions or requirements from Council or other legislation or Bylaws or Regulations that may be applicable.

- 2.4 The approval granted shall not exempt the applicant from complying with any other legal prescriptions or requirements that might have a bearing on the proposed use.

Subdivision, rezoning, departure and closure of public place

- 2.5 The development be undertaken in accordance with the Subdivisional and Zoning Plan with reference; Drawing Project Number 1001918, dated 04/10/2024, drawn by Zutari Impact Engineered and attached as **APPENDIX B**.
- 2.6 An electronic copy (shp, dwg, dxf) of the approved General Plan be submitted to the Directorate Planning and Economic Development for record purposes, which plan indicate the following information:
- 2.4.1) Newly allocated erf numbers
 - 2.4.2) Co-ordinates
 - 2.4.3) Survey dimensions
 - 2.4.4) Street names and numbering
- 2.7 The servitude rights over any property be registered in the title deeds of the applicable property/ies on registration.
- 2.8 Building plans be submitted and approved by the Municipality prior to the commencing of any building works, including the preparation of land, which will only be approved when all relevant conditions of approval have been complied with.
- 2.9 Compliance with the conditions relating to infrastructure services contained in memorandum (Civil LU2644, dated 05 August 2024) and attached as **APPENDIX F**.
- 2.10 Compliance with the conditions relating to Electrical services Department contained in memorandum dated 26/02/2024 and attached as **APPENDIX G**.
- 2.11 Sufficient on-site parking be provided in accordance with the provisions of the Zoning Scheme Bylaw and to be illustrated on the building plans.
- 2.12 Activities on site, during construction and thereafter, comply with the Western Cape Noise Control regulations.
- 2.13 During constructions the relevant implementing agent/contractor must take all reasonable steps to prevent nuisance caused by dust in accordance with the national Dust Control Regulations.
- 2.14 Should any heritage resources, including evidence of graves and human burials, archaeological material and paleontological material be discovered during the execution of the activities above, all works must be stopped immediately and Heritage Western Cape must be notified without delay.
- 2.15 The Surveyor General – Western Cape in terms of Section 26(7) of the Bylaw on Municipal Land Use Planning (2023) be informed of the approval of the closure of the public place to endorse their records.
- Telecommunication base stations:**
- 2.16 The development be undertaken in accordance with the building plan Rev No BP-7001-REV1, Sheet 3, 4, 5, 6, dated 10/11/2023 and drawn by Urban Solutions for ATC South Africa, attached as **APPENDIX B**.
- 2.17 Access to the telecommunication infrastructure and associated equipment be strictly controlled at all times by means of a fence or wall with a locked door or gate to the satisfaction of the Municipality.
- 2.18 No unauthorised person be able to come within 5m in front of the panel antennae for the telecommunication infrastructure.
- 2.19 Adequate warning signs in the three official languages be displayed on the access door or gate, defining it as a no-go zone.
- 2.20 The relevant municipal department be grant access at all reasonable times to the installation, for the purpose of monitoring inspection and compliance certification.
- 2.21 The consent use be restricted to the fenced compound of the mast and equipment room as depicted on the approved building plan.
- 2.22 The mast, equipment room or any boundary enclosure is not utilised for outdoor advertising purposes.

- 2.23 The operator be responsible for ongoing maintenance of the entire installation as well as all costs with respect to such maintenance or future decommissioning of the telecommunication infrastructure.
- 2.24 If the site is decommissioned the operator to remove all site infrastructure and the site to be rehabilitated to its former state or to a condition that is in line with the land use and character of the area at the time of decommissioning to the satisfaction of the Municipality.

3 The **reasons** for the above decision are as follows:

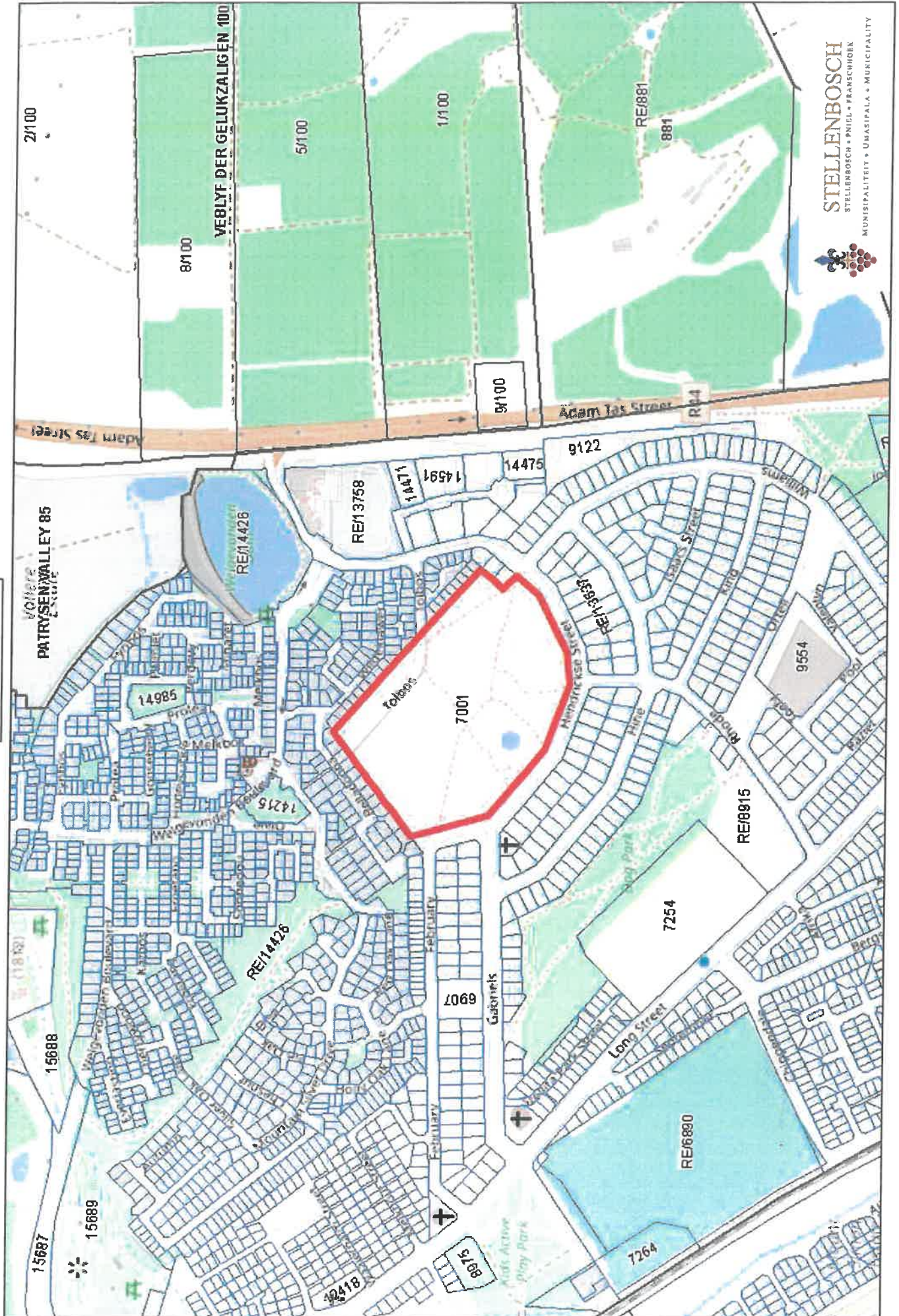
- 3.3 The property is needed by the Municipality for an integrated urban settlement development to address the municipal housing backlog and Erf 7001, Stellenbosch (Cloetesville area) was identified as a suitable site for such a development with a particular goal to deliver on their mandate to provide medium to upper market (GAP) housing opportunities.
- 3.4 The closure of the public place will be in the interest of the broader community and a portion will be retained for public open space purposes. The closure will regularize some of the current uses (Utility Services) and will enable the various other statutory processes to realize the sites long-term potential, earmarked for infill development.
- 3.5 It is not envisaging that the health, safety and welfare of the community will be affected negatively by the proposed telecommunication base station and mast, and will rather be beneficial to the broader community and customer base, with the increase in coverage and capacity.

4 Matters **to be noted**:

- 4.3 Street naming and numbering must be submitted, process, approved and implemented as per the approved policy and delegations.
- 4.4 Architectural and landscaping design proposals must form part of the scope of works for the call for proposal and implemented accordingly.

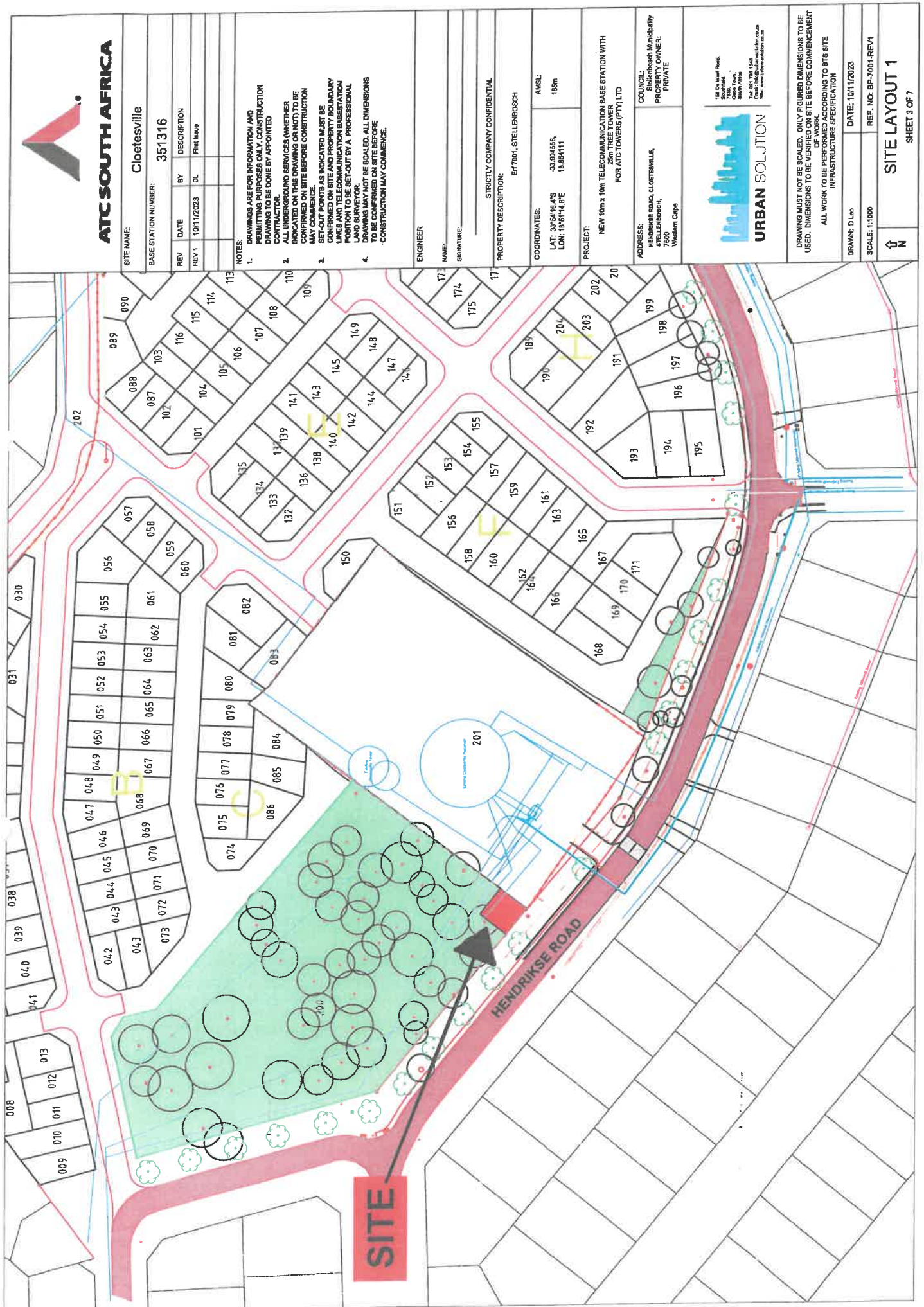
APPENDIX A: Locality Plan

LOCALITY PLAN



APPENDIX B:
Zoning & Subdivision Plan and
Telecommunication Base Station Plans

Portion #	Area sqm	Portion #	Area sqm	Portion #	Area sqm	Portion #	Area sqm	Portion #	Area sqm	Portion #	Area sqm	Portion #	Area sqm	Portion #	Area sqm	Portion #	Area sqm	Portion #	Area sqm
1	312	35	160	69	162	103	178	137	130	171	157	205	5866						
2	291	36	160	70	134	104	223	138	131	172	144	206	8.4						
3	291	37	119	71	129	105	201	139	140	173	160	207	6506						
4	282	38	122	72	128	106	191	140	129	174	160	208	17976						
5	281	39	128	73	126	107	224	141	128	175	160								
6	282	40	117	74	128	108	253	142	128	176	160								
7	282	41	131	75	126	109	159	143	128	177	185								
8	286	42	137	76	128	110	147	144	128	178	165								
9	286	43	145	77	126	111	198	145	128	179	142								
10	286	44	152	78	128	112	198	146	128	180	173								
11	286	45	126	79	125	113	197	147	128	181	138								
12	267	46	128	80	207	114	207	148	160	182	155								
13	269	47	128	81	185	115	401	149	243	183	158								
14	148	48	127	82	158	116	351	150	176	184	158								
15	143	49	126	83	128	117	157	151	127	185	156								
16	142	50	115	84	128	118	146	152	126	186	192								
17	167	51	128	85	128	119	146	153	125	187	183								
18	131	52	128	86	128	120	147	154	125	188	144								
19	156	53	115	87	130	121	137	155	148	189	160								
20	155	54	128	88	185	122	154	156	167	190	160								
21	155	55	128	89	157	123	151	157	128	191	160								
22	155	56	128	90	159	124	178	158	128	192	160								
23	155	57	128	91	154	125	278	159	128	193	151								
24	155	58	128	92	156	126	282	160	128	194	145								
25	155	59	128	93	150	127	149	161	128	195	128								
26	155	60	128	94	154	128	241	162	128	196	128								
27	154	61	128	95	145	129	273	163	200	197	128								
28	148	62	127	96	152	130	128	164	158	198	222								
29	160	63	127	97	141	131	131	165	158	199	263								
30	135	64	163	98	151	132	174	166	160	200	175								
31	160	65	160	99	162	133	177	167	246	201	220								
32	140	66	163	100	184	134	128	168	218	202	945								
33	160	67	163	101	178	135	129	169	169	203	548								
34	160	68	160	102	165	136	129	170	163	204	261								



 ATC SOUTH AFRICA		SITE NAME: Cloetessville	
		BASE STATION NUMBER: 351316	
REV	DATE	BY	DESCRIPTION
REV 1	10/11/2023	DL	Final Issue
NOTES: 1. DRAWINGS ARE FOR INFORMATION AND CONSTRUCTION ONLY. CONSTRUCTION DRAWINGS TO BE DONE BY APPOINTED CONTRACTOR. 2. ALL UNDERGROUND SERVICES (WHETHER INDICATED ON THIS DRAWING OR NOT) TO BE CONFIRMED ON SITE BEFORE CONSTRUCTION MAY COMMENCE. 3. ALL DIMENSIONS INDICATED MUST BE CONFIRMED ON SITE AND PROPERTY BOUNDARY LINES AND TELECOMMUNICATION INFRASTRUCTURE POSITION TO BE SET-OUT BY A PROFESSIONAL LAND SURVEYOR. 4. DRAWING MAY NOT BE SCALED. ALL DIMENSIONS TO BE CONFIRMED ON SITE BEFORE CONSTRUCTION MAY COMMENCE.			
ENGINEER: NAME: _____ SIGNATURE: _____			
STRICTLY COMPANY CONFIDENTIAL PROPERTY DESCRIPTION: E47001, STELLENBOSCH			
COORDINATES: LAT: 33°54'16.43" LON: 18°51'14.8"E		AMSL: 180m	
PROJECT: NEW 10m x 10m TELECOMMUNICATION BASE STATION WITH 25m TREE TOWER FOR ATC TOWERS (PTY) LTD			
ADDRESS: HENDRIKSE ROAD, CLOETESSVILLE, 7800, Western Cape		COUNCIL: Stellenbosch Municipality PROPERTY OWNER: PRIVATE	
 100 De Vries Road, Stellenbosch, Western Cape, 7600 Tel: 021 885 1111 Email: info@urbansolution.co.za Web: www.urbansolution.co.za			
DRAWING MUST NOT BE SCALED. ONLY FIGURED DIMENSIONS TO BE USED. DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCEMENT OF WORK. ALL WORK TO BE PERFORMED ACCORDING TO BTS SITE INFRASTRUCTURE SPECIFICATION			
DRAWN: D. Lee		DATE: 10/11/2023	
SCALE: 1:500		REF. NO: BP-7001-REV1	
 SITE LAYOUT 2		SHEET 4 OF 7	

SITE

HENDRIKSE ROAD

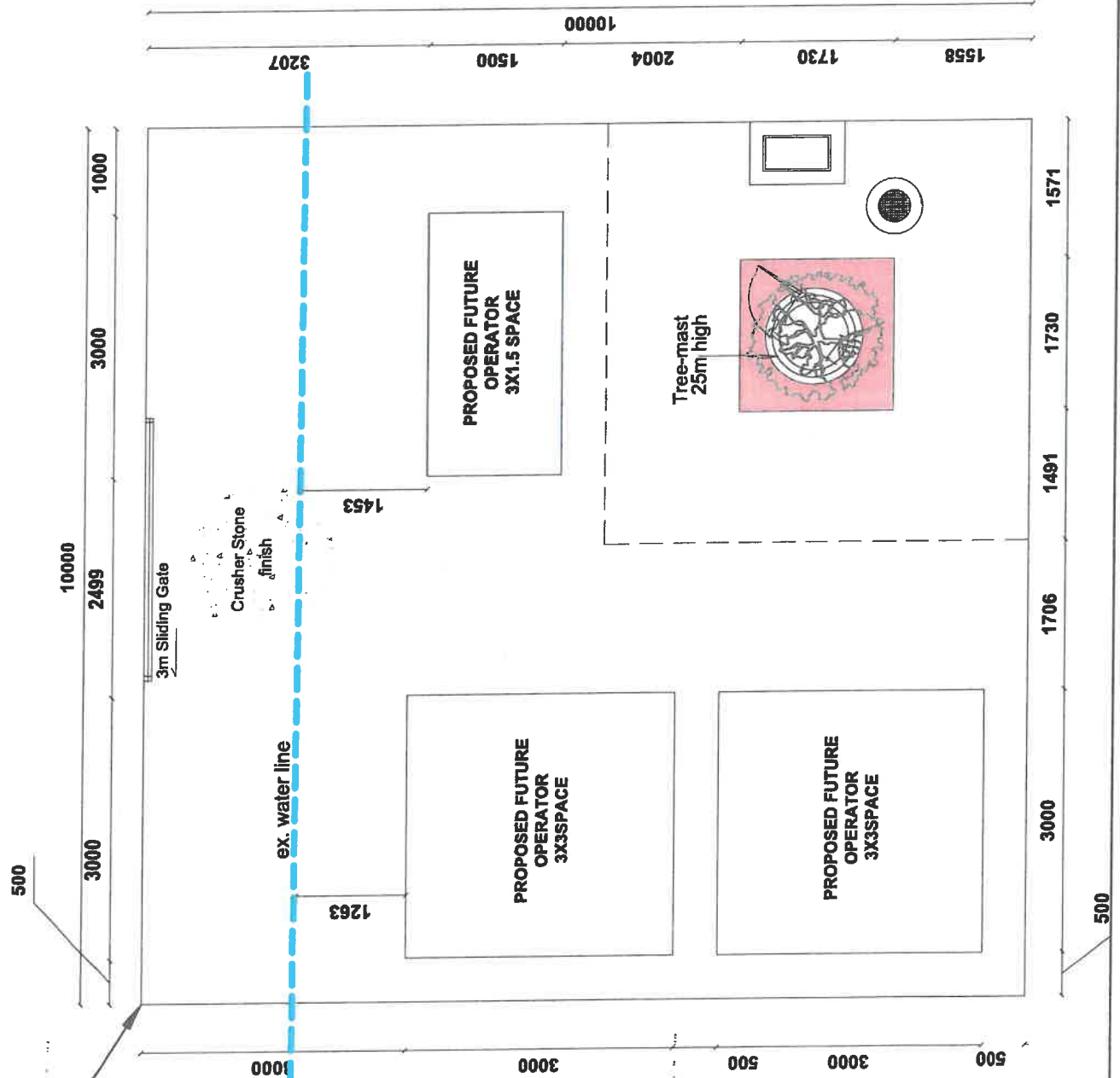
Existing Cloetessville Town

Existing Cloetessville Town

ATC SOUTH AFRICA

SITE NAME: Cloetesville	
BASE STATION NUMBER: 351316	
REV	DATE BY DESCRIPTION
REV 1	10/11/2023 DL First Issue
NOTES:	
1. DRAWINGS ARE FOR INFORMATION AND PERMITTING PURPOSES ONLY. CONSTRUCTION DRAWING TO BE DONE BY APPOINTED CONTRACTOR.	
2. ALL UNDERGROUND SERVICES (WHETHER INDICATED ON THIS DRAWING OR NOT) TO BE CONFIRMED ON SITE BEFORE CONSTRUCTION MAY COMMENCE.	
3. SET-OUT POINTS AS INDICATED MUST BE CONFIRMED ON SITE AND PROPERTY BOUNDARY LINES AND TELECOMMUNICATION BASESTATION POSITION TO BE SET-OUT BY A PROFESSIONAL LAND SURVEYOR.	
4. DIMENSIONS MAY NOT BE BOULDER. ALL DIMENSIONS TO BE CONFIRMED ON SITE BEFORE CONSTRUCTION MAY COMMENCE.	
ENGINEER	
NAME:	
SIGNATURE:	
PROPERTY DESCRIPTION: STRICTLY COMPANY CONFIDENTIAL ET 7001, STELLENBOSCH	
COORDINATES:	AMSL
LAT: 33°54'16.4"S	-33.894556,
LONG: 18°51'14.8"E	18.854111
PROJECT: NEW 10m x 10m TELECOMMUNICATION BASE STATION WITH 25m TREE TOWER FOR KID TOWERS (PTY) LTD	
ADDRESS:	COUNCIL: Stellenbosch Municipality
1000m ROAD, CLOETESVILLE, STELLENBOSCH, 7800	PROPERTY OWNER: PRIVATE
 <p>100 Du Toit Road, Stellenbosch, 7800, South Africa Tel: 021 795 1443 Email: info@urban-solution.co.za Web: www.urban-solution.co.za</p>	
DRAWING MUST NOT BE SCALED. ONLY FIGURED DIMENSIONS TO BE USED. DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCEMENT OF WORK.	
ALL WORK TO BE PERFORMED ACCORDING TO ETS SITE INFRASTRUCTURE SPECIFICATION	
DRAWN: D Leo	DATE: 10/11/2023
SCALE: 1:50	REF. NO: BP-7001-REV1
 ACTUAL SITE LAYOUT SHEET 5 OF 7	

2,4m High clear vu fence
with shark tooth spikes &
electric fence on top -
Not painted



APPENDIX C: Applicants Motivation

Application in terms of Sections 15(2)(a), 15(2)(b), 15(2)(d), 15(2)(n) and 15(2)(o) of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2015, for the Rezoning and Subdivision of Erf 7001 Cloetesville, Stellenbosch

Motivation Report

Cloetesville Housing Development - Rezoning and Subdivision of Erf 7001 Cloetesville Stellenbosch

The Rezoning and Subdivision of Erf 7001, Stellenbosch

Stellenbosch Municipality Housing Development

Submission date: 2023/11/30



STELLENBOSCH
STELLENBOSCH - EN KENNIS - ENKES

Document control record

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Document Control						
Project name		Cloetesville Housing Development - Rezoning and Subdivision of Erf 7001 Cloetesville Stellenbosch				
Document number		1	Project number		1001918	
Client		Stellenbosch Municipality				
Client contact		Shaun October Programme Manager Department: Housing Development Directorate: Planning & Economic Development T: +27 21 808 8756 NPK Building, corner of Rynveld and Van Riebeeck Streets, 2nd Floor, Stellenbosch, 7600		Reference		Rezoning and Subdivision of Erf 7001 Cloetesville Stellenbosch
Rev	Date	Revision details/status	Author	Reviewer	Verifier (if required)	Approver
0	2023/11/30	Final Draft	Nondumiso Buthelezi	Rudolf Schröder	Rudolf Schröder	Rudolf Schröder
Current revision		0				

Approval			
Author signature		Approver signature	
Name	Nondumiso Buthelezi	Name	Rudolf Schröder
Title	Candidate Planner	Title	Professional Planner

Table of Contents

1 INTRODUCTION & BACKGROUND	7
1.1 Introduction	7
1.2 Background	7
1.3 Application	7
1.4 Purpose of Memorandum	8
1.5 Pre-Application Consultation	8
1.6 Information Required in terms of Section 38 of the By-Law	8
1.7 Applicant Detail	9
2 PROPERTY PARTICULARS	10
2.1 Property Description, Registered Owner & Title Deed	10
2.2 Locality	10
2.3 Extent	13
2.4 Jurisdiction	14
2.5 Restrictive Title Conditions	15
2.6 Surveyor General Diagrams and Servitudes	15
2.6.1 Public Place	16
2.7 Mortgage Bond	18
2.8 Applicable Zoning Scheme and Current Zoning	18
2.9 Analysis and Site Photos	20
2.10 Topography	26
2.11 Current Land Use	27
3 PROPOSED DEVELOPMENT	28
3.1 Development Proposal	28
3.2 Site informants	29
3.3 Design Approach	29
3.3.1 Approach to Housing	29
3.3.2 Approach to structuring streets	30
3.3.3 Approach to neighbourhood streets	31
3.4 Site Concept Options	31
3.5 Preferred Development Concept	32
3.6 Housing Typologies	33
3.6.1 Housing Precedent	35
4 APPLICATION PARTICULARS	39
4.1 Proposed Rezoning	39
4.2 Proposed Departure from the development parameters of the zoning scheme	39
4.3 Proposed Subdivision	41
4.4 Proposed closure of public space	43
4.5 Proposed consent for the erection of a telecommunications mast on the proposed public open space erf (erf 205)	44
4.6 Proposed land uses	46
5 MOTIVATION	47
5.1 Land development principles	47
5.1.1 Spatial justice	47
5.1.2 Spatial sustainability	47
5.1.3 Efficiency	47
5.1.4 Spatial resilience	48

5.1.5	Good administration	48
5.2	Need and Desirability	48
5.2.1	Need	48
5.2.2	Desirability	48
5.2.3	Strategic Local and Provincial Planning Frameworks	48
5.2.4	Location and accessibility of the property	52
5.2.5	Physical characteristic of the property.....	52
5.2.6	Environmental Impact.....	52
5.3	Engineering & Bulk Services	57
5.3.1	Water Infrastructure.....	57
5.3.2	Sewer Infrastructure	58
5.3.3	Stormwater	59
5.3.4	Solid Waste	62
5.3.5	Electrical Services	62
5.3.6	Transport Planning	65
6	PUBLIC PARTICIPATION	69
7	CONCLUSION	70

Annexures

ANNEXURE	DESCRIPTION
A	Application Form, completed and signed by Applicant
B	Power of Attorney (Zutari's Appointment Letter & SLA)
C	Proof of Registered Ownership (Title Deed)
D	Copy of the Surveyor-General's Diagram
E	Locality Plan
F	Subdivisional Layout Plan / Site Development Plan
G	Zoning Certificate
H	SACPLAN Registration Certificate
I	SG Status Report
J	Contour Cadastral Basemap
K	Telecommunication Mast Infrastructure Drawings
L	Environmental Authorisation
M	Geotechnical Report
N	Services Investigation Report (Civil)
O	Traffic Impact Assessment Report
P	Electrical Services Report

Figures

Figure 1: Western cape province

- Figure 2: Locality of Stellenbosch Municipality
 Figure 3: Erf 7001, Cloetesville in relation to Stellenbosch
 Figure 4 - Locality of the project site.
 Figure 5: Windeed Report
 Figure 6 - SG Diagram for Erf 7001, Cloetesville, Stellenbosch
 Figure 7 - Existing Water Services over the site
 Figure 8 - Figure in green represents public space as per Surveyor General's records
 Figure 9 - Surveyor General Status Report
 Figure 10 - Erf 7001 Zoning Certificate
 Figure 11 - Zoning of Erf 7001, Stellenbosch according to the Stellenbosch Municipality Zoning Scheme 2019
 Figure 12 - Erf 7001 Stellenbosch
 Figure 13 - Erf 7001 Stellenbosch
 Figure 14 - Erf 7001 Stellenbosch
 Figure 15 - Erf 7001 Stellenbosch
 Figure 16: Photos of the site and area
 Figure 17: Land survey map
 Figure 18 - Erf 7001 Topography
 Figure 19 - Cloetesville topography, elevation & terrain
 Figure 20 - Current Land Use
 Figure 21 - Development Concept
 Figure 22: Site informants
 Figure 23 - Block typology.
 Figure 24 - Structuring Streets
 Figure 25 - Neighbourhood Streets
 Figure 26 - Development Concept (Scenario 1) Figure 27 - Development Concept (Scenario 2)
 Figure 28 - Development Concept (Scenario 3) Figure 29 - Development Concept (Scenario 4)
 Figure 30 - Development Concept with a Range of erf sizes
 Figure 31 – Range of House Types to be incorporated on the various categories of stands
 Figure 32 - Typical Examples of Housing that could be developed
 Figure 33 - Example of Row Housing and Semi-detached housing with stand sizes from the adjacent Welgevonded Estate
 Figure 34 - Example of Row Housing and Semi-detached housing with stand sizes from the adjacent Welgevonded Estate
 Figure 35 - Example of Row Housing and Semi-detached housing with stand sizes from the adjacent Welgevonded Estate
 Figure 36 - Figure in Green represents public space as per Surveyor General's records
 Figure 37 - Surveyor General Status Report
 Figure 38 - Area of Erf 204 (zoned as Public Open Space) where application is made for a consent use for the erection of a Cell Mast.
 Figure 39 - Site planning for the 10m by 10m cell mast area
 Figure 40 - Elevation of proposed cell mast
 Figure 41 – Subdivisional Layout Plan
 Figure 42: Map adapted from Stellenbosch Municipality SDF, 2019 - indicating that the land is located within the urban edge and earmarked for development ("explore opportunities for new high density infill development")
 Figure 43: Map adapted from Stellenbosch Municipality SDF, 2019 - indicating that the land is earmarked for Mixed-use Community and Residential in-fill.
 Figure 44 - Stellenbosch Municipality IDP - 2022 -2027
 Figure 45 - Stellenbosch Municipality IDP - 2022 -2027
 Figure 46: Vegetation map
 Figure 47: Photo of Bermuda grass and weed on the site
 Figure 48: Pine trees on the site
 Figure 49: Watercourses map (No water courses present)
 Figure 50: Water reservoir and tower

Figure 51 - DEADP Letter confirming that no environmental authorisation is required

Figure 52 - Position of trial holes

Figure 53: Bulk water upgrades (GLS Master Plan 2019)

Figure 54: Bulk Sewer Upgrades (GLS Master Plan 2019)

Figure 55: Drainage routes

Figure 56: Stellenbosch Municipality bulk electrical network

Figure 57: Electrical network surrounding the site

Figure 58: Possible future developments

Figure 59: Key intersections

Figure 60 - Examples of shared streets

Tables

Table 1: Information required in terms of Section 38 of the By-Law

Table 2: Applicant Details

Table 3: Property Details

Table 4: Current Development Controls

Table 5 - Housing Typologies

Table 6: Expected Maximum Demand Breakdown (based on preliminary projected land use)

Table 7: Traffic counts

Table 8: Estimated trips for proposed development

1 INTRODUCTION & BACKGROUND

1.1 Introduction

Zutari was appointed by Stellenbosch Municipality (Housing Department) to undertake a broad conceptual urban design framework on ERF 7001, Cloetesville, Stellenbosch, and to prepare and submit this application to the Stellenbosch Municipality on their behalf to obtain town planning and development rights.

Application is made for the rezoning and subdivision of the land parcel known as Erf 7001 Cloetesville, Stellenbosch in order to create additional housing opportunities to the medium to upper (GAP) target market.

1.2 Background

The Municipality has a database (waiting list) in excess of 18 200 persons requiring housing and any development proposal needs to be aligned to the identified need. The particular goal of this housing development is the delivery of medium to upper (GAP) housing units. There is accordingly an urgent need for the Property to be developed to create an integrated urban development, providing for housing choice together with appropriate economic and social amenities. The town planning and design principles have incorporated aspects of integration, designing for community safety, accessibility, and dignified spaces.

Application is therefore made in terms of Section 15(2) for the **rezoning** of the area known as Erf 7001 and to simultaneously apply in terms of the Stellenbosch Municipality Land Use Management By-laws, 2015 for the **permanent departure** from the development parameters of the zoning scheme; to **subdivide** the erf into various land portions as depicted on the attached subdivision layout plan; for the **closure of a part of a public space** and for a **consent use** to erect a telecommunications mast on the portion to be zoned as Public Open Space Zone.

1.3 Application

An application is hereby submitted for the following:

- i. In terms of Section **15(2)(a)** of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2015, for the **rezoning** of Erf 7001 Stellenbosch from "Public Open Space Zone" to a "subdivisional area" in order to allow for the following uses:
 - 201 Conventional Residential Zone Erven
 - ~~5.4~~ Public Open Space Zone Erven
 - 1 Utility Services Zone Erf
 - Public Road\$
 as shown on the proposed Subdivision plan (attached as **Annexure F**).
- ii. In terms of Section **15(2)(b)** of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2015, for a **permanent departure** from the development parameters of the zoning scheme in accordance with the prescriptions detailed in this application.
- iii. In terms of Section **15(2)(d)** of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2015, for the **subdivision** of Erf 7001 in accordance with the attached Subdivision plan (attached as Annexure F), in order to give effect to the proposed land uses.

- iv. In terms of Section **15(2)(n)** of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2015, for the **closure of a part of a public space**.
- v. In terms of Section **15(2)(o)** of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2015, for **consent use** to erect a telecommunications mast on the portion to be zoned as Public Open Space Zone (Erf 205).

1.4 Purpose of Memorandum

- (i) To gather all relevant information regarding the proposed rezoning and subdivision proposal into one document;
- (ii) To analyse all relevant information regarding the site and informants to the design of the proposed development, and
- (iii) To motivate the need and desirability of the proposed rezoning and subdivision Erf 7001 Stellenbosch, in terms of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2015, in order to enable the relevant governing bodies to make an informed decision.

1.5 Pre-Application Consultation

In terms of **Section 37** of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2015:

- (1) The Municipality may require an owner who intends to submit an application or his or her agent to meet with the authorised employee and, where applicable, with employees of other relevant organs of state for a pre-application consultation before he or she submits an application to the Municipality in order to determine the information and documents that must be submitted with the application.
- (2) The Municipality may issue guidelines regarding—
 - (a) applications that require a pre-application consultation;
 - (b) the nature of the information and documents that must be submitted with an application;
 - (c) the attendance of employees from the Municipality or other organs of state at a pre-application consultation; and
 - (d) the procedures at a pre-application consultation.
- (3) The Municipality must keep minutes of the proceedings of a pre-application consultation.

In terms of this application and the development proposal contained herein, several consultation sessions were held with the project stakeholders and relevant municipal officials and a formal pre-application was submitted to the Municipality on 13 September 2023, where-after a pre-planning consultation was held with the Stellenbosch Municipality's Planning Department.

Some technical adjustments to the layout plan were required whereafter it was confirmed that the applicant can proceed with the submission of a formal rezoning and subdivision application.

1.6 Information Required in terms of Section 38 of the By-Law

In terms of Section 38 of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2015, an application must be accompanied by the following information and documents:

Table 1: Information required in terms of Section 38 of the By-Law

Information Required	Location	Included in the Application	
		Yes	No
Application form, completed and signed by applicant	Annexure A	X	
Power of Attorney & Proof that the person is authorised to act on behalf of the Client	Annexure B	X	
Proof of Registered Ownership (Title Deed)	Annexure C	X	
Bondholder's Consent	N/A		
Written motivation for the application based on the criteria referred to in Section 65	See Report	X	
Copy of the Surveyor-General's diagram	Annexure D	X	
Locality Plan	Annexure E	X	
Subdivisional Layout Plan	Annexure F	X	
Proof of Payment of Application Fees	No application fees are due as it is the Municipality's own application.		
Conveyancer's Certificate indicating that the application is not restricted by any condition contained in the title deed.	Application to be referred to the Municipality's legal department for comments.		
Minutes of pre-application consultation	Numerous consultations and discussions were held with the Municipality's technical departments in the planning of the proposed development.		

1.7 Applicant Detail

Stellenbosch Municipality is the lawful owner of the property as stated on the registered title deed of the property (T56720/1987). Attached please find a copy of the Title Deed, T56720/1987 (**Annexure C**).

The Stellenbosch Municipality appointed Zutari (Pty) Ltd to submit an application for rezoning and subdivision on their behalf. Zutari (Pty) Ltd, in their capacity as consultant for Stellenbosch Municipality, was authorised by the Municipality to sign any and all relevant documentation which may be necessary for the proposed planning application on behalf of the Municipality. The procuration signed by the Stellenbosch Municipality, appointed Zutari (Pty) Ltd. as the lawful agent to prepare and compile the documentation required for the change in land use rights and

subdivision of Erf 7001 Cloeteville. Attached please find a copy of Zutari's appointment letter and Service Level Agreement (**Annexure B**).

Table 2: Applicant Details

Applicant, full name and title	Zutari (Pty) Ltd. Reg No. 1977/003711/07
Contact Person of Authorised Professional Planner	Rudolf Schröder
SACPLAN Registration number:	A/151/2009 (See registration certificate attached)
Street Address	Suite 201 2 nd Floor Bloemhof Building 65 York Street George 6529
Telephone Number	+27 44 805 5400 / +27 83 390 6963
Email Address	rudolf.schroder@zutari.com

See SACPLAN registration certificate attached as **Annexure H**.

2 PROPERTY PARTICULARS

2.1 Property Description, Registered Owner & Title Deed

The property that forms the site of application is known as Erf 7001 Stellenbosch (also referred to as 'the site of application') located in the neighbourhood of Cloeteville. The registered owner of the property as reflected on the title deed T56720/1987 is the Stellenbosch Municipality. See **Annexure C** for a copy of the Title Deed (T56720/1987). Attached please also find a copy of Zutari's appointment letter and Service Level Agreement authorising Zutari to submit an application on the Municipality's behalf (**Annexure B**).

Erf 7001 Stellenbosch	
Title Deed Number:	T56720/1987
Title Deed Description:	Erf 7001 Stellenbosch.
Registered Owner	Stellenbosch Municipality
Extent:	6.5341ha

Table 3: Property Details

2.2 Locality

Stellenbosch is located in the Western Cape South Africa:

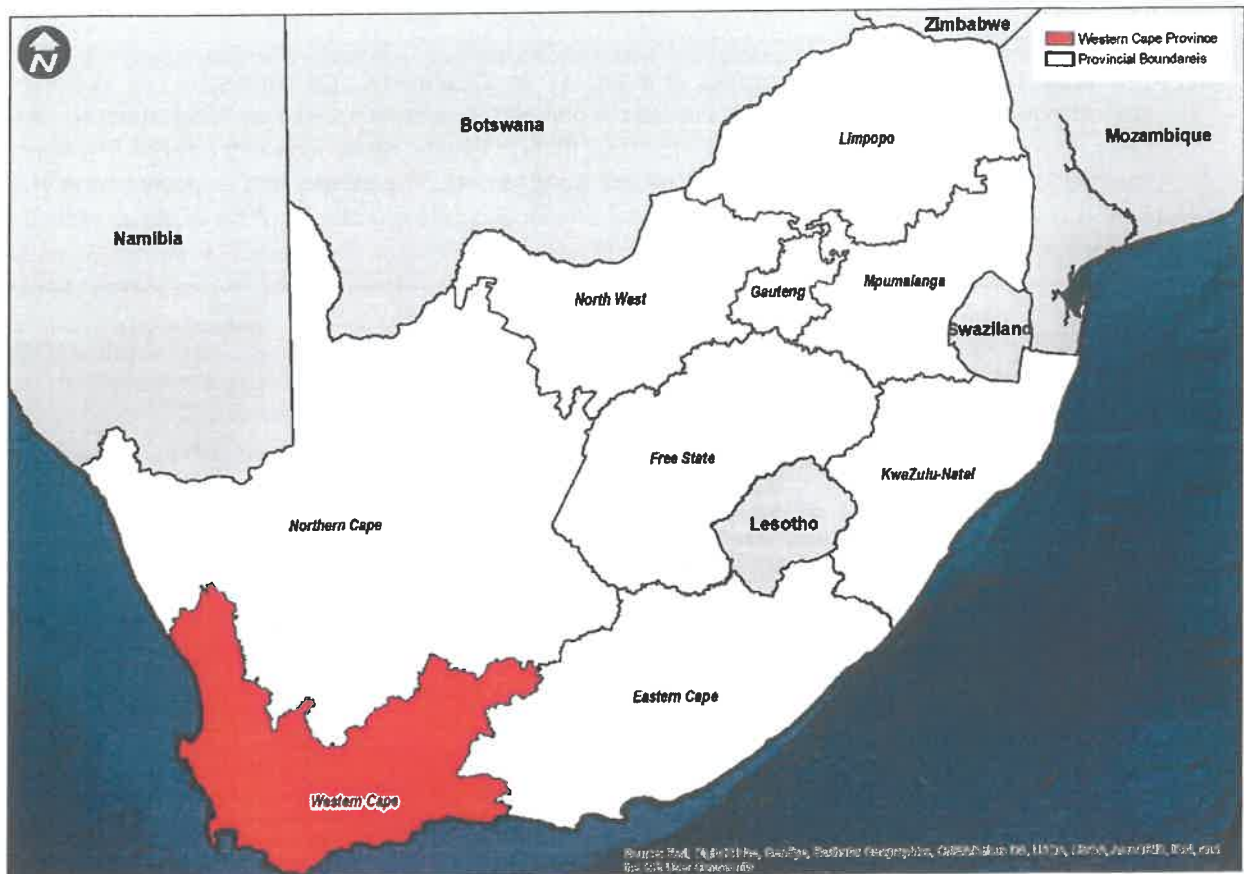


Figure 1: Western cape province

The map below (extracted from the 2014 Western Cape Provincial Spatial Development Framework (PSDF)) provides an indication of the spatial location of Stellenbosch within the Western Cape Province and depicts its connectivity to adjacent major centres.

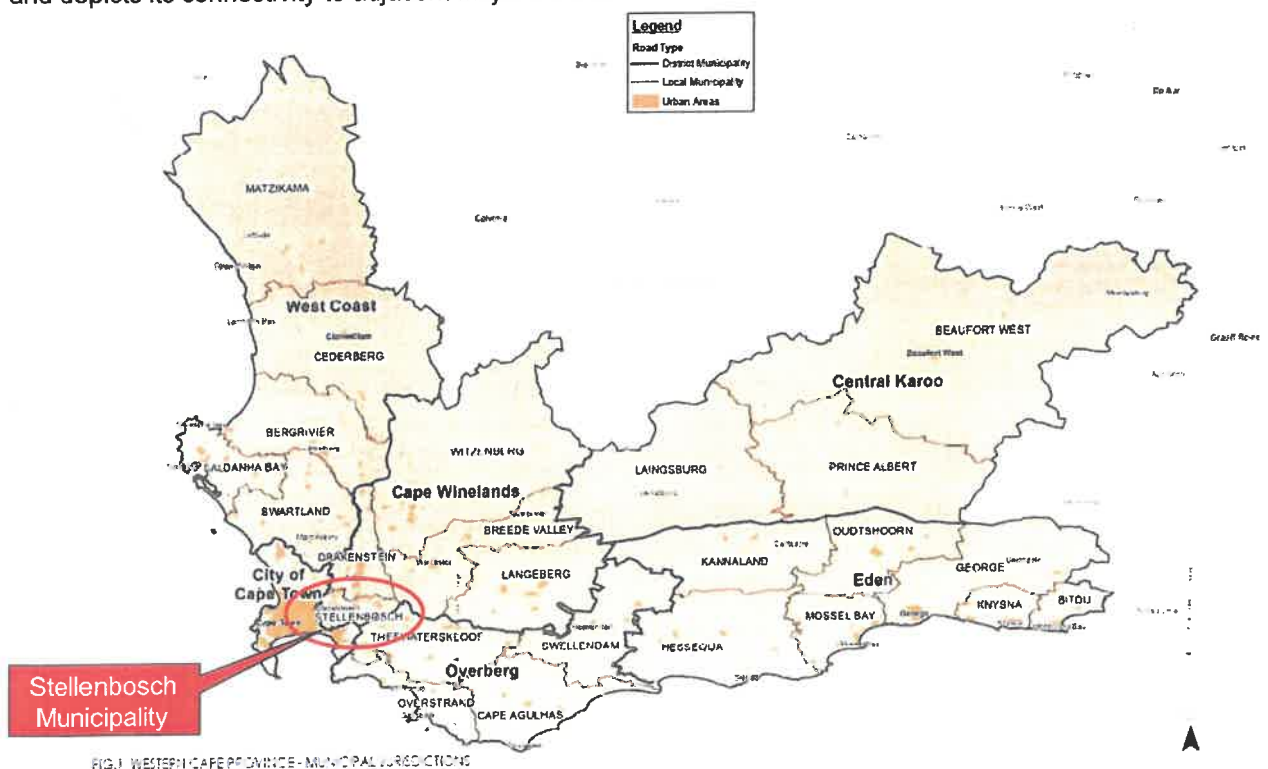


Figure 2: Locality of Stellenbosch Municipality

The project site, Erf 7001 is located in Ward 17 in Cloetesville, Stellenbosch. The Ward is a predominantly residential ward which includes a part of Cloetesville as well as Welgevonden, Green Oaks, Stellita Park, Weltevrede and the Municipal Flats in Rhode, Kloof and Long Streets. The ward is bordered by the R44 Klapmuts road, Lakey and Long streets. The subject site is located west of the R44. It is in close proximity to a primary school and local sports ground. Erf 7001 is characterised by numerous trees.

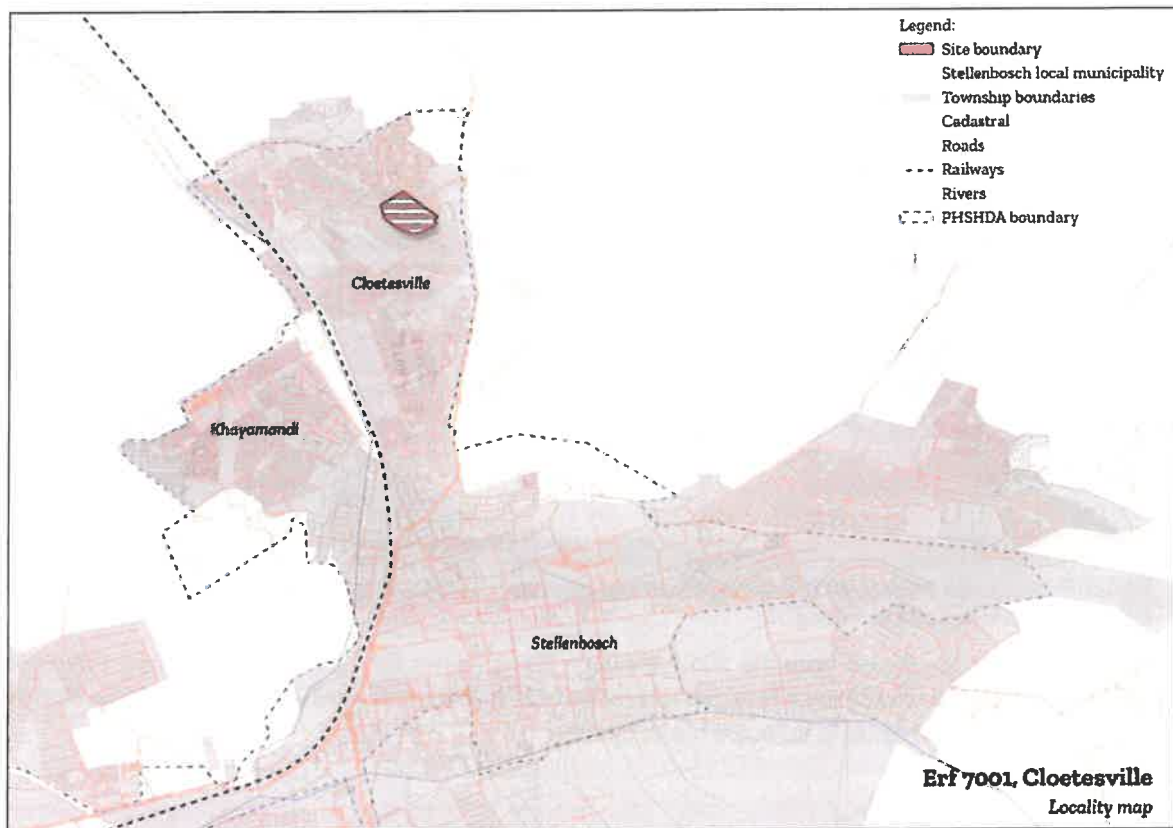


Figure 3: Erf 7001, Cloetesville in relation to Stellenbosch

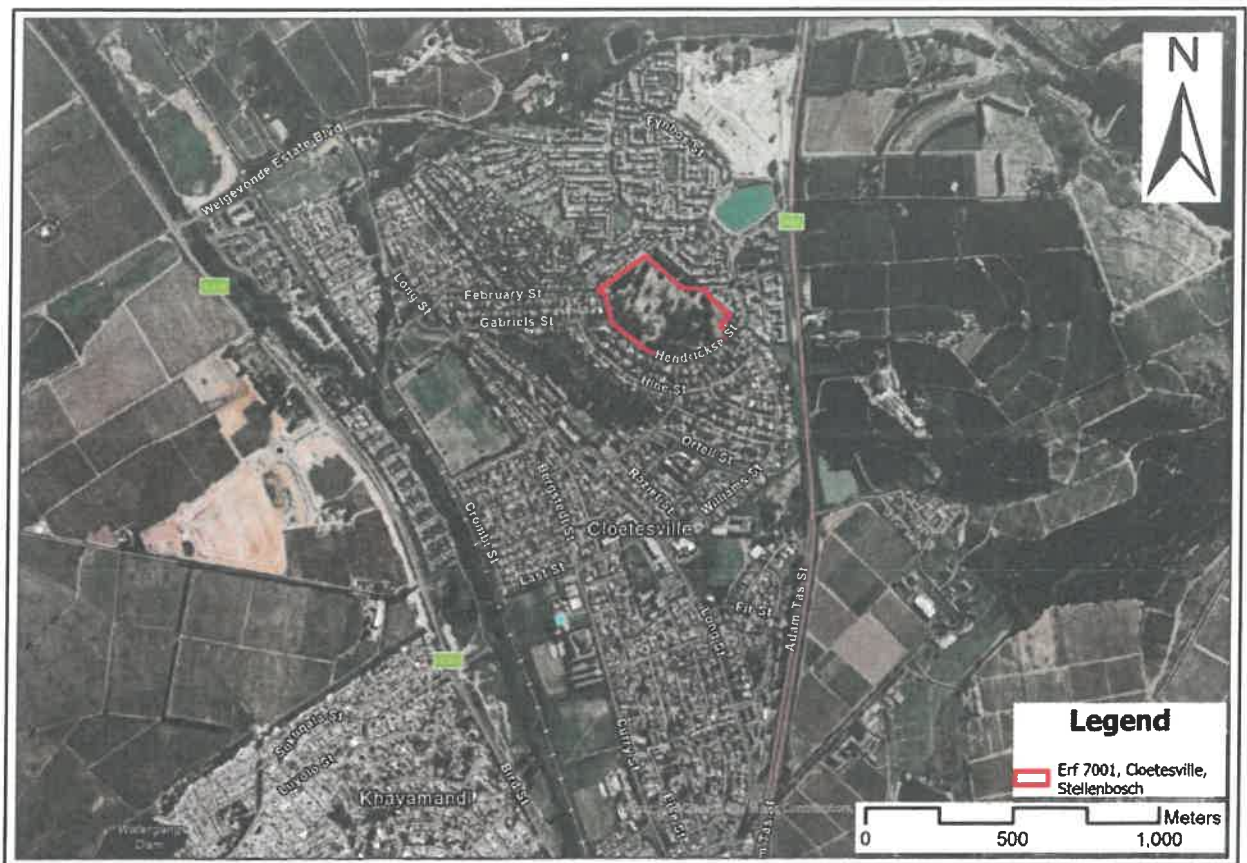


Figure 4 - Locality of the project site.

2.3 Extent

The total extent of Erf 7001 Stellenbosch is illustrated as being 6.534 hectares in extent according to the Windeed Report.



This report is compiled exclusively from the very latest data directly supplied to WinDeed by the Deeds Office.

Any personal information obtained from this search will only be used as per the Terms and Conditions agreed to and in accordance with applicable data protection laws including the Protection of Personal Information Act, 2013 (POPI), and shall not be used for marketing purposes.

**** ASTERISKS INDICATE THE INFORMATION IS ENRICHED FROM THE WINDEED DATABASE.**

SEARCH CRITERIA

Search Date	2023/11/15 10:00	Erf Number	7001
Reference	-	Portion Number	-
Report Print Date	2023/11/15 10:01	Township Remaining Extent	NO
Township	STELLENBOSCH	Search Source	Deeds Office
Deeds Office	Cape Town		

PROPERTY INFORMATION

Property Type	ERF	Diagram Deed Number	T56720/1987
Township	STELLENBOSCH	Local Authority	STELLENBOSCH MUN
Erf Number	7001	Province	WESTERN CAPE
Portion Number	0 (REMAINING EXTENT)	Remaining Extent	YES
Registration Division	STELLENBOSCH RD	Extent	6.5341H
Previous Description	PTN OF 7271-TP9460	LPI Code	C06700220000700100000
Suburb / Town**	STRAND	Co-ordinates (Lat/Long)**	-33.904101 / 18.855066

OWNER INFORMATION (1)

MUN STELLENBOSCH		Owner 1 of 1	
Company Type**	LOCAL AUTHORITY	Document	T56720/1987
Registration Number	-	Microfilm / Scanned Date	1987 139 9 :16:14
Name	MUN STELLENBOSCH	Purchase Price (R)	CRT
Multiple Owners**	NO	Purchase Date	-
Multiple Properties**	NO	Registration Date	1987/11/23
Share (%)	-		

ENDORSEMENTS (1)

#	Document	Institution	Amount (R)	Microfilm / Scanned Date
1	PUBLIC-PLACE	-	-	-

Figure 5: Windeed Report

See subsequent sections of this report for more detail in this regard.

2.4 Jurisdiction

Stellenbosch Municipality, Western Cape Province, South Africa.

2.5 Restrictive Title Conditions

There are no conditions in the title deed of the property that are deemed as being restrictive to the proposed development.

Please refer to the attached Copy of Title Deed T56720/1987 (**Annexure C**). The Municipality's Legal Department will be requested to provide confirmation that the application is not restricted by any condition contained in the title deed.

2.6 Surveyor General Diagrams and Servitudes

The SG diagram for the property is attached as **Annexure D**

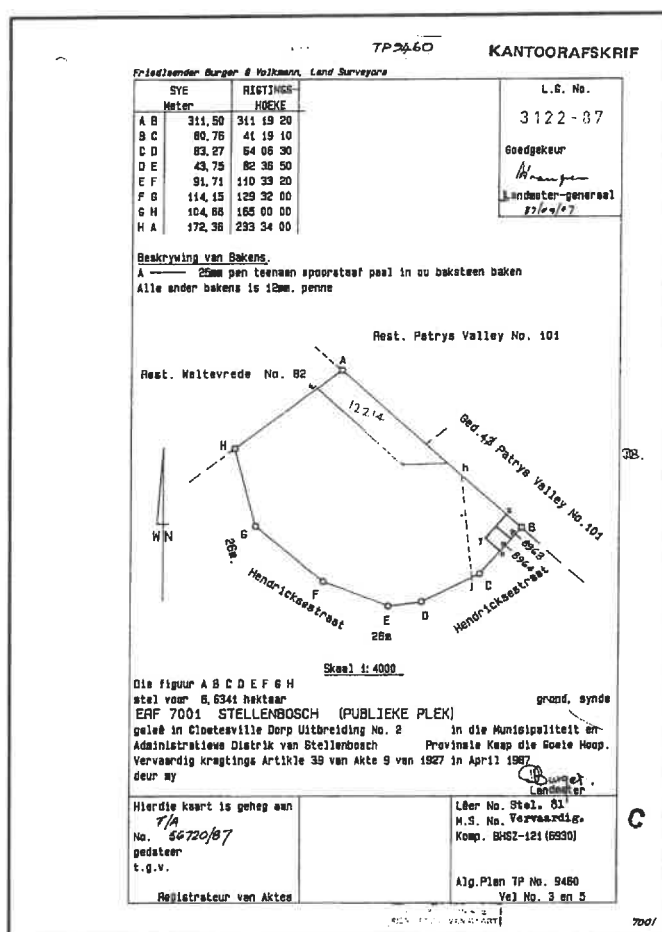


Figure 6 - SG Diagram for Erf 7001, Cloetesville, Stellenbosch

The area representing Erf 12214 was previously subdivided from erf 7001 and closed as a public space but the erf was never registered in the Deeds office and is therefore still legally part of Erf 7001.

There are a number of existing and planned water pipelines that run from the water reservoir over the site. The positions of these pipelines have been incorporated into the design of the proposed development and will be secured by formal servitudes that will be registered over the site:



Figure 7 - Existing Water Services over the site

2.6.1 Public Place

A Status Report has been obtained from the Surveyor General's office which confirms that a portion of Erf 7001 is classified as a "public space" according to the Surveyor General's records, as per the area marked in Green in the image below. The area representing Erf 12214 was previously subdivided from erf 7001 and closed as a public space but the erf was never registered in the Deeds office and is therefore still legally part of Erf 7001. **This application includes applying for the closure of a part of a public space in terms of Section 15(2)(n) of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2015.**

See the status report as received from the Surveyor General's office attached to this application as Annexure I.

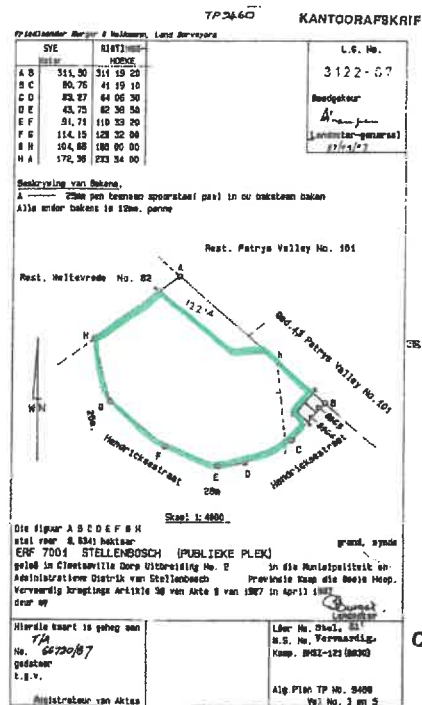


Figure 8 - Figure in green represents public space as per Surveyor General's records

(R S A)

Tel: (021) 457 2000
Fax: (021) 465 3008

DAVID HELLIG & ABRAHAMSE
PROFESSIONAL LAND SURVEYORS
PO BOX 910
CAPE TOWN
8000

2023-10-02

MY REF: STEL. 31 v.6 p347
Your ref: S384/22 Dated: 2023-08-28

**Note: THIS STATUS REPORT
IS VALID FOR 3 YEARS**

Attention: James Florence

Sr

**STATUS REPORT: CLOSURE OF REMAINDER OF PUBLIC PLACE ERF 7001
STELLENBOSCH**

1. The proposed closure of land as shown coloured Green on your attached Diagram represents: **PORTION OF ERF 7001 STELLENBOSCH**

It is shown as a **Public Place** in my records.

2. **FOR OFFICE USE** The following properties will be endorsed: **ERVEN 7001, 8963, 8964 AND 12214 STELLENBOSCH AND GENERAL PLAN NO. 8489/1998**

3. Endorsement fees amount to: **R 900.00.**

4. I require a copy of a diagram suitable for registration purposes, surveyed and framed by a land surveyor, of the following: **N/A**

5. A written consent (accompanied by a sketch) is required in terms of Section 23(1) of the Stellenbosch Municipality's Municipal Land Use Planning By-Law 2015 for the amendment of **GENERAL PLAN NO: N/A**

Yours faithfully



D CLOETE
For SURVEYOR-GENERAL: WESTERN CAPE

FOR OFFICE USE

CERTIFICATE: GAZETTE No. DATED:	p
--	----------

Figure 9 - Surveyor General Status Report

See the status report as received from the Surveyor General's office attached to this application as **Annexure I.**

2.7 Mortgage Bond

There are no mortgage bonds registered against the property.

2.8 Applicable Zoning Scheme and Current Zoning

The Stellenbosch Municipality: Zoning Scheme By-Law, 2019 is the applicable Zoning Scheme for the site of application.

According to the Stellenbosch Municipality Zoning Scheme 2019, Erf 7001 is zoned **"Public Open Space Zone"** with the development controls provided in the table below (See zoning Certificate attached as Annexure G):



Our Ref : 7001
Contact per : A. Gwintsa
Contact no. : (021) 808 8881
Date : 29 September 2023

ZONING CERTIFICATE

Erf 7001 Stellenbosch, Administrative District of Stellenbosch, Province of the Western Cape

1. ZONING SCHEME PROVISIONS APPLICABLE TO THE SUBJECT PROPERTY

In accordance with the Stellenbosch Zoning Scheme Bylaw 2019, the base zone allocated to the above property, is:

PUBLIC OPEN SPACE ZONE.

In terms of the provisions of the said Bylaw, this base zone may provide for the following Primary, Additional and Consent land uses:

PRIMARY USES PERMITTED	ADDITIONAL USES (TECHNICAL APPROVAL)	CONSENT USES (APPLICATION REQUIRED)
<ul style="list-style-type: none"> Open space Natural environment Private road Occasional use (one event/ year) 	Land development requiring technical approval in terms of Section 15 of the Stellenbosch Land Use Planning Bylaw, 2015 <ul style="list-style-type: none"> Rooftop base telecommunication station 	Land development requiring approval in terms of Section 15 of the Stellenbosch Land Use Planning Bylaw, 2015 <ul style="list-style-type: none"> Camping site Cemetery Employee housing Freestanding base telecommunication station Indoor sport Market Occasional use (>one event/year) Outdoor sport Tourist accommodation establishment Tourist facilities

Figure 10 - Erf 7001 Zoning Certificate

Zoning	Public Open Space Zone
Primary uses permitted	<ul style="list-style-type: none"> • Open Space • Natural environment • Private Road • Occasional use
Additional Uses (Technical Approval) Land development requiring technical approval in terms of Section 15 of the Stellenbosch Land Use Planning Bylaw, 2015	<ul style="list-style-type: none"> • Rooftop base telecommunications station
Consent Uses (Application Required) Land development requiring technical approval in terms of Section 15 of the Stellenbosch Land Use Planning Bylaw, 2015	<ul style="list-style-type: none"> • Camping site • Cemetery • Employee Housing • Freestanding base telecommunication station • Indoor sport • Market • Occasional use • Outdoor sport • Tourist accommodation establishment • Tourist facilities

Table 4: Current Development Controls

No additional, consent or temporary land uses have been approved on the subject property.

The property may only be used for the permitted land uses detailed above and for no other purposes, unless applied for in terms of the requirements of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2015.

The proposed development is therefore not aligned with the current zoning and the property will need to be rezoned to accommodate the development proposal.

The zoning of Erf 7001 Stellenbosch is confirmed in the zoning certificate attached in **Appendix G** and illustrated in the image below.



Figure 11 - Zoning of Erf 7001, Stellenbosch according to the Stellenbosch Municipality Zoning Scheme 2019

2.9 Analysis and Site Photos

Erf 7001 is situated in Ward 17, a predominantly residential ward which includes a part of Cloeteville as well as Welgevonden, Green Oaks, Stellita Park, Weltevrede and the Municipal Flats in Rhode, Kloof and Long Streets. The borders of the ward are the R44 Klapmuts road, Lakey and Long streets.

There are numerous trees on the site as shown in the images below. The site is also located immediately adjacent to a man-made water retention structure as indicated in the photos below. Furthermore, the site is situated adjacent to the Welgevonden Estate which is a gated community/security estate.



Figure 12 - Erf 7001 Stellenbosch

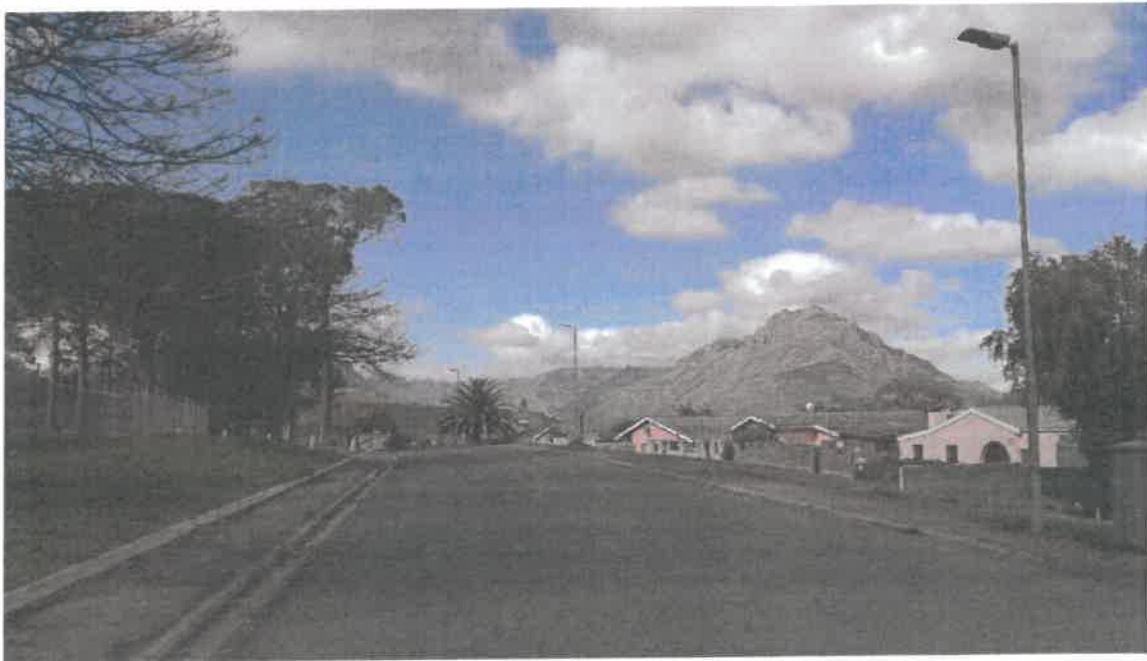




Figure 13 - Erf 7001 Stellenbosch



Figure 14 - Erf 7001 Stellenbosch



Figure 15 - Erf 7001 Stellenbosch

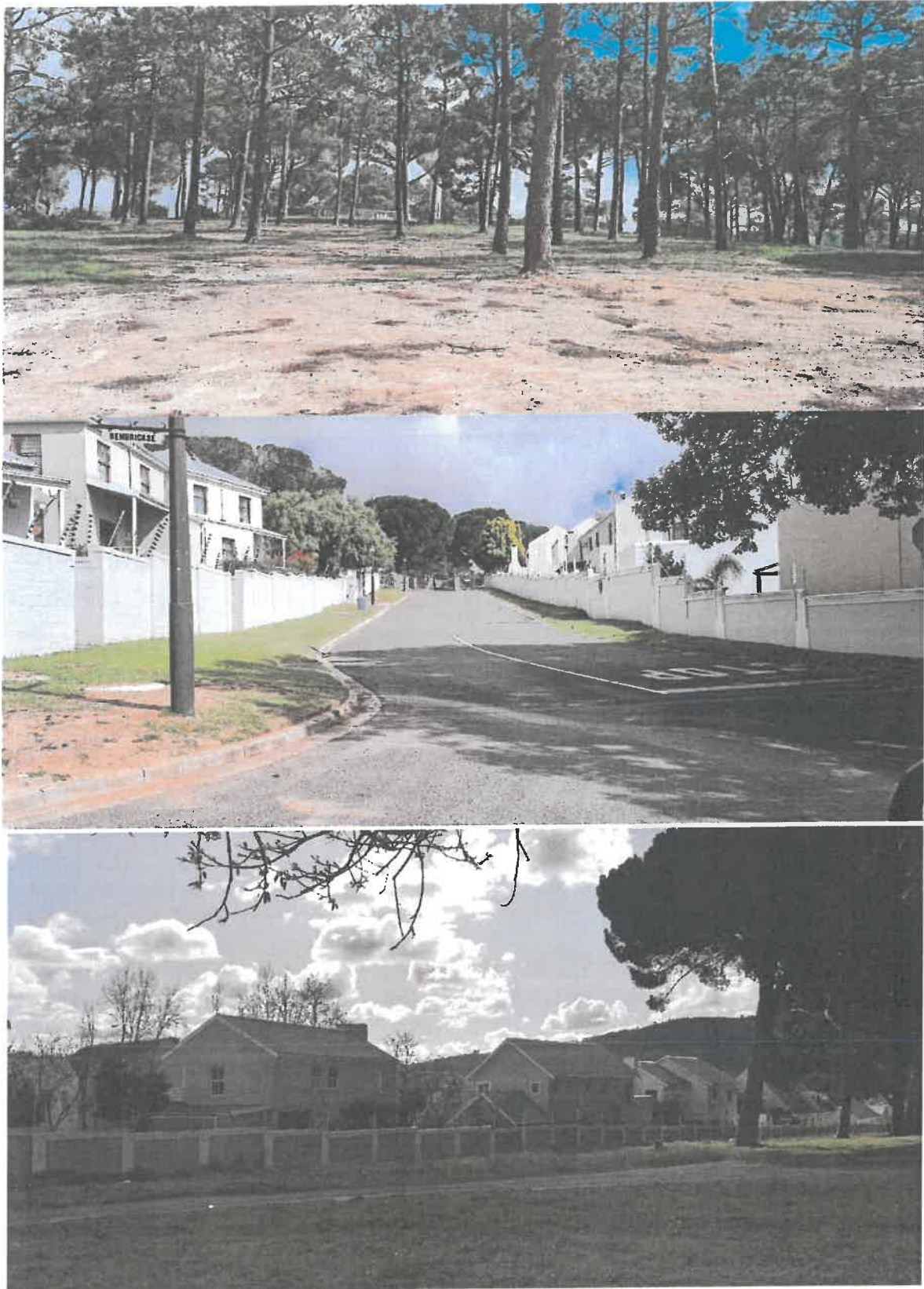


Figure 16: Photos of the site and area

2.10 Topography

The site of development has a gentle sloping topography that is ideal for the proposed housing development. A topographical and cadastral basemap was prepared by David and Hellig Land Surveyors. The figures below show the survey map of the area indicating large trees and any available services, also refer to the **Contour Cadastral Basemap** attached as **Annexure J** for more details.



Figure 17: Land survey map

A topographical map of the area is provided below. The proposed water pipeline to be established on the site from the water reservoir has been incorporated into the design of the proposed development.

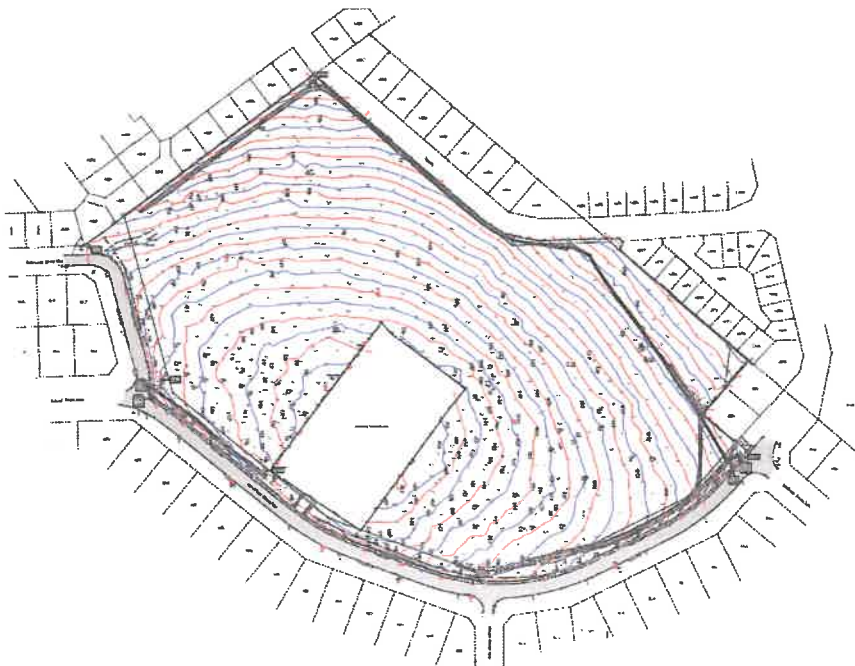


Figure 18 - Erf 7001 Topography



Figure 19 - Cloetesville topography, elevation & terrain

2.11 Current Land Use

The site is currently vacant with some municipal infrastructure (water reservoir) and a large number of trees that are present on the site.

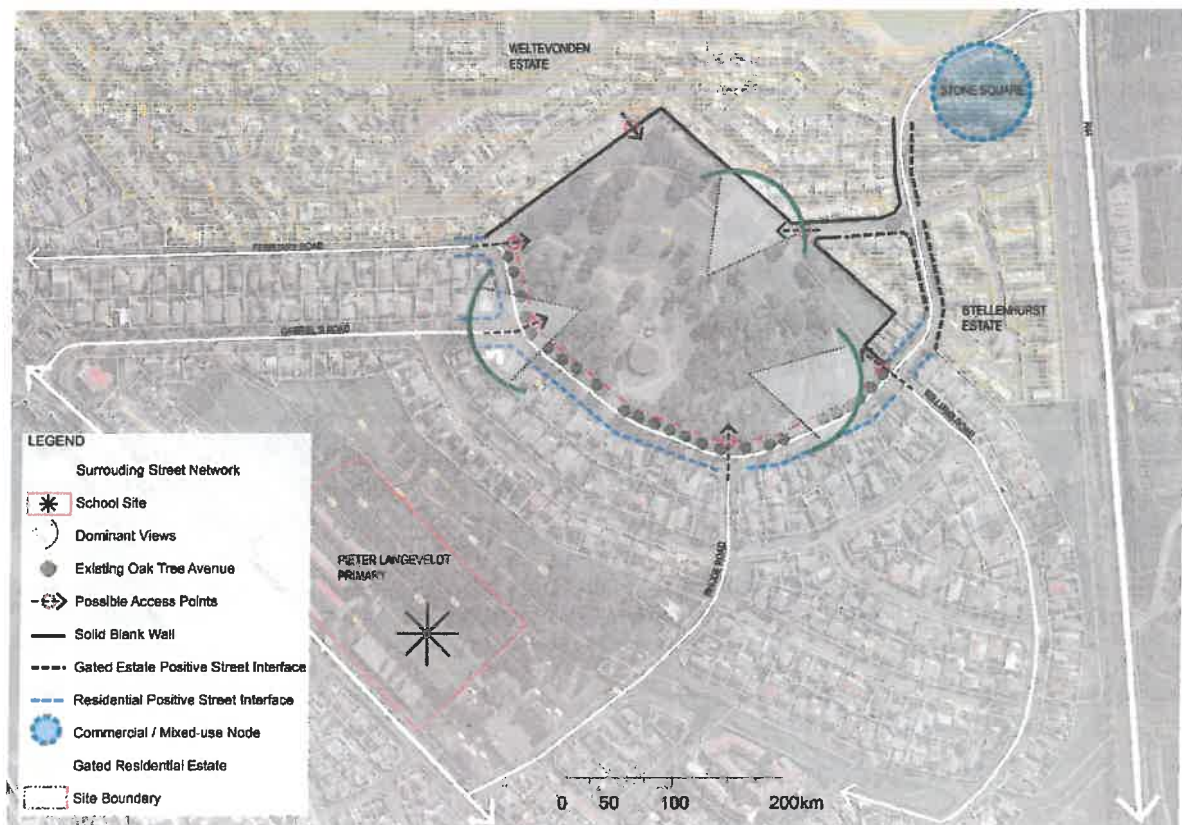


Figure 20 - Current Land Use

3 PROPOSED DEVELOPMENT

The project aims to facilitate a sustainable integrated development including medium to upper income housing units (GAP) that will;

- Address housing needs in Cloetesville; and
- Ensure social and economic sustainability of the inhabitants of Cloetesville and beneficiaries as defined by the Stellenbosch Municipality.

The particular goal of this housing development is the delivery of medium to upper (GAP) housing units. There is an urgent need for the Property to be developed so as to create an integrated urban development, providing for housing choice together with appropriate economic and social amenities. This will be achieved with due consideration for the particular environment within which the project is located as well as the optimum development potential of the subject property.

During the concept development stage of the project, various development scenarios were prepared and considered which included diverse housing typologies, diverse land-use mix and a summary of density comparisons/ feasibility schedule. The town planning and design principles have incorporated aspects of integration, designing for community safety, accessibility, and dignified spaces.

3.1 Development Proposal

The figure below illustrates the preferred concept plan, which formed the basis for the subdivisional layout drawing that is part of this application. This concept (development proposal) is based on environmental, social, economic, heritage, infrastructure and urban design inputs from various specialists, and has been further refined as more detailed planning progressed and more in-depth studies were conducted.



Figure 21 - Development Concept

As more detailed planning and investigations have been conducted, the development concept has been further refined and improved to culminate in the proposed subdivision layout plan that forms the basis of this rezoning/subdivision application.

3.2 Site informants

The large number of mature as well as avenue of newer oak trees along the south edge provide an opportunity to integrate the development with existing trees maintaining the sense of place of the site. The erf is located between the R44 and Lang Road with easy access to both allowing for integration of the site into Stellenbosch. There is an existing mixed-use node on the corner of the R33 and Hendrikse Road (Stone Square) that provides easy access to commercial/retail amenities. The slope towards the north provides opportunities for views to the mountains. The solid walls of the gated Welgevonden Estate create a negative interface along the northern western and eastern boundary of the site. Existing and proposed water infrastructure limits development in the south-western corner of the site.

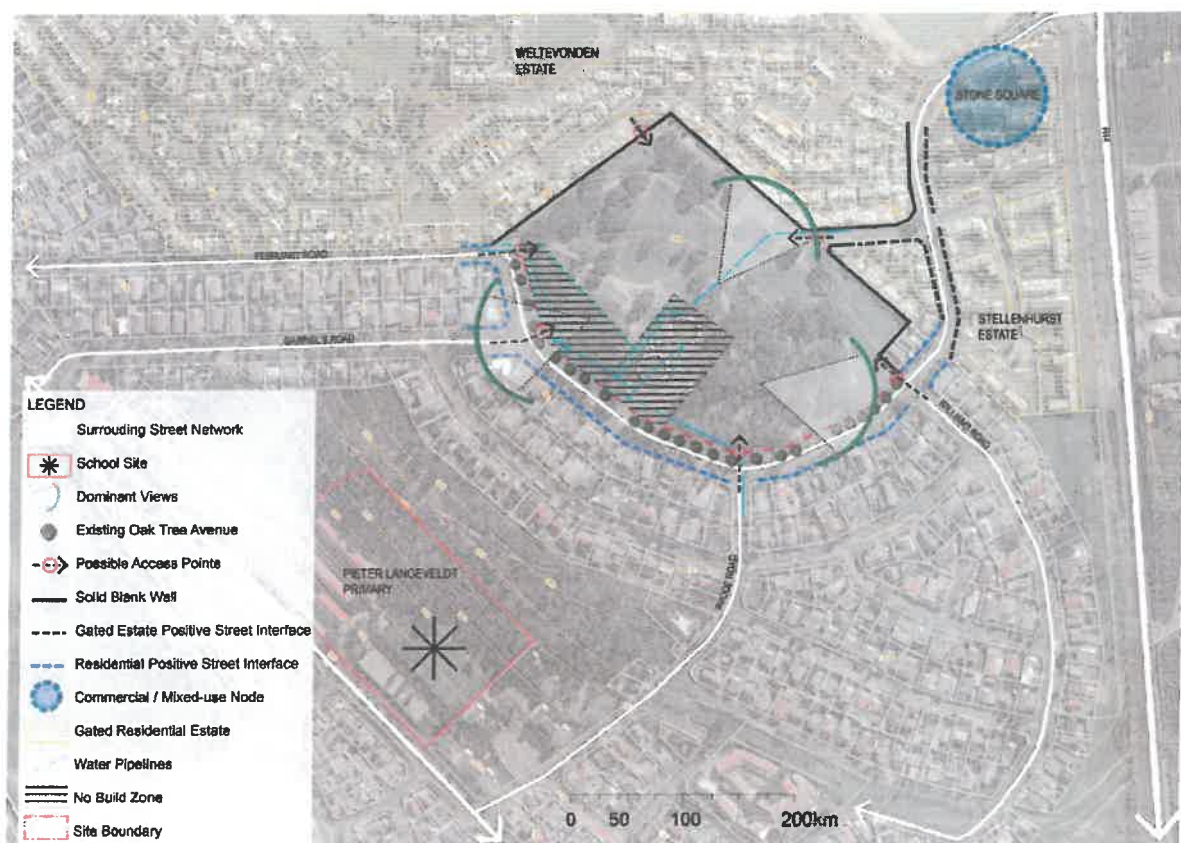


Figure 22: Site Informants

3.3 Design Approach

3.3.1 Approach to Housing

A maximum flexibility block approach has been considered to allow for street blocks to be broken up in different ways to accommodate varying approaches to land use, building typology and density. This flexible block approach creates room to accommodate changing needs over time.

A variety of housing typologies and erf configurations have been considered to support flexibility in relation to market / income groups, financing options, density and mix of typologies. Depending on

market conditions in the future, the block design can for instance accommodate apartments to be developed on some of the blocks if the individual residential stands are consolidated.

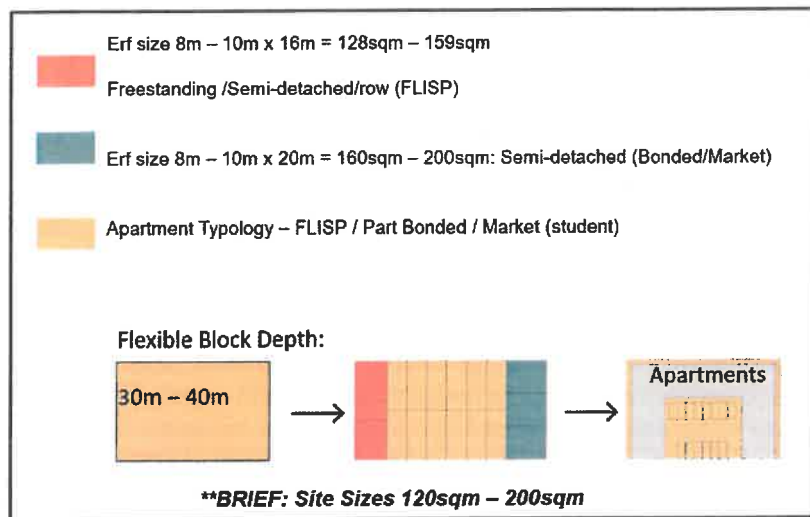


Figure 23 - Block typology.

3.3.2 Approach to structuring streets

13-meter streets associated with primary movement streets for the residential component of the development have been considered in the design approach:

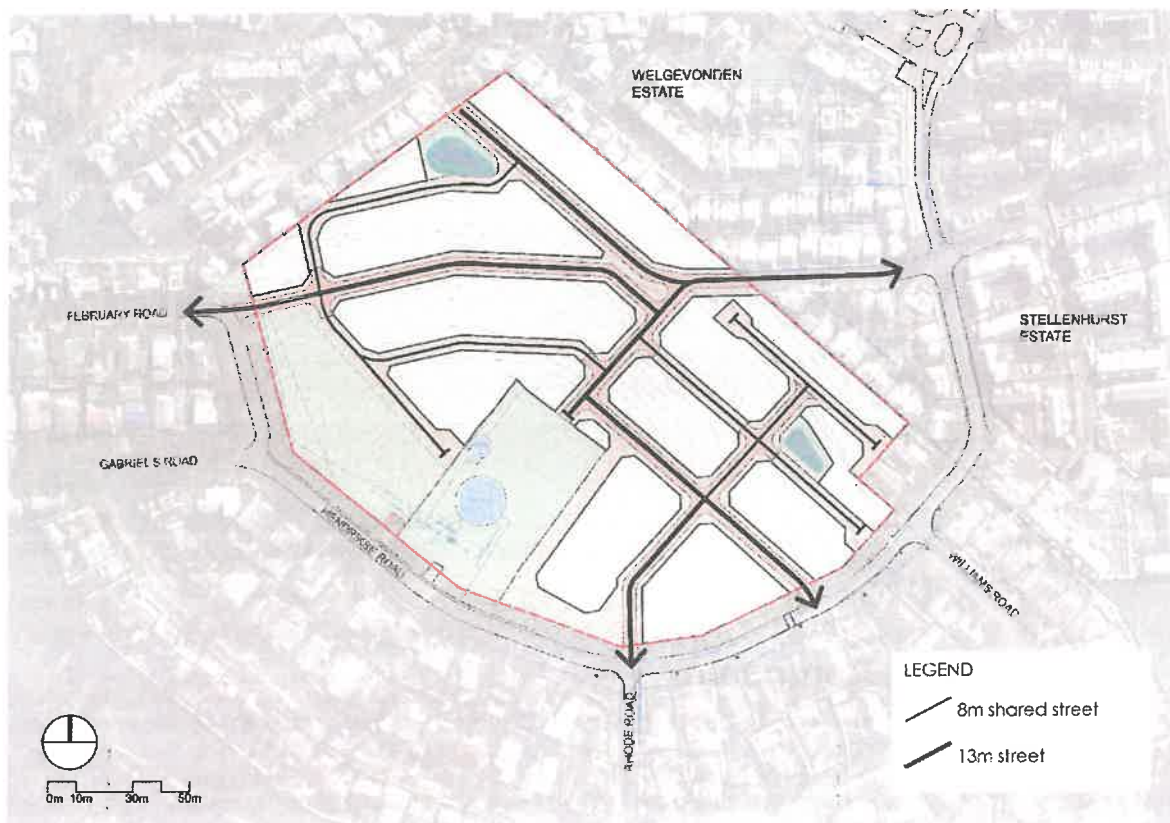


Figure 24 - Cloetesville Movement Network

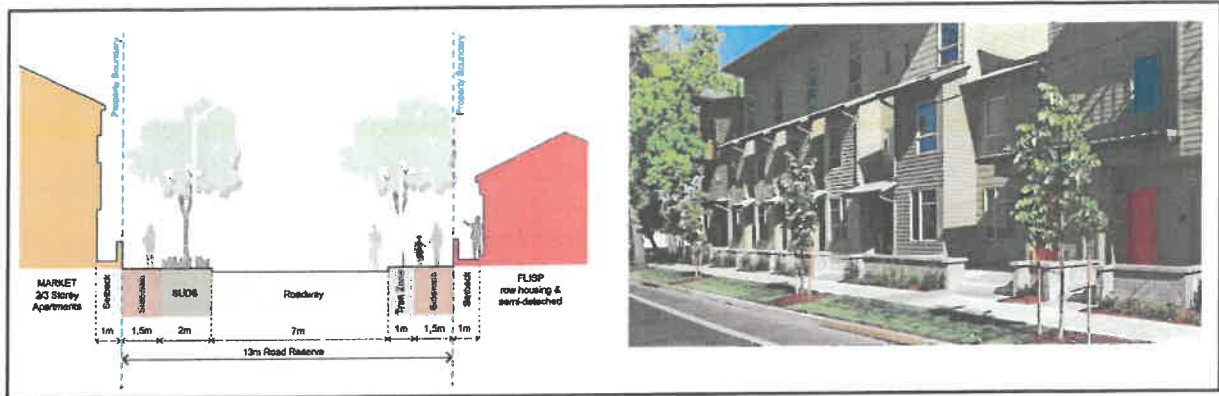


Figure 25 - Structuring Streets

3.3.3 Approach to neighbourhood streets

Two different options for 8-metre neighbourhood streets servicing lower density residential typologies have been considered namely, single surface shared streets, and dedicated roadway and sidewalks as illustrated in the images below.

Refer to **Section 5.3.8.4** of this report (Motivation for the inclusion of 8m Road Reserves in the Development Layout) for more information and the rationale for including 8m road reserves in the development.

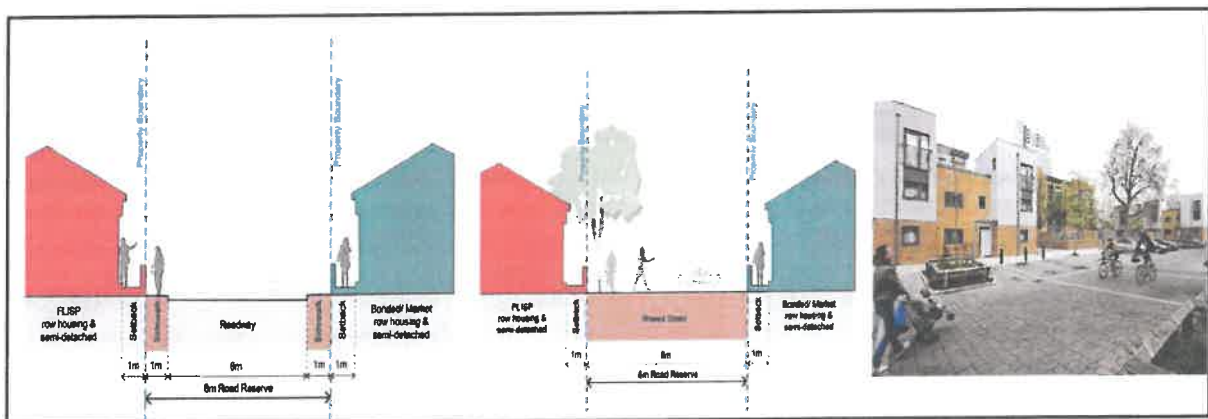


Figure 26 - Neighbourhood Streets

3.4 Site Concept Options

During the feasibility planning process of the project, various site concept options were developed and considered. The various scenarios incorporated a range of different housing typologies and densities. Development option 3 was chosen by the Municipality as the most desirable option and is now the basis of this application, which have been further refined and amended into the current subdivision layout included in this application. The various scenarios that were considered are illustrated in the figures below:

Site Concept
Option 1

- Residential Yard
- Single residential - 14 units
- Backyard site - 200 (1500sqm)
- TOTAL: 214 units



Site Concept
Option 1

- Erf size 120 - 150sqm
TOTAL: 64 units
- Erf size 180 - 200sqm
TOTAL: 20 units
- Apartment Typology
TOTAL: 320 units
- TOTAL: 384 units



Site Concept
Option 2

- Residential Yard
- Single residential - 104 units
- Backyard site - 277 (1500sqm)
- TOTAL: 381 units



Site Concept
Option 2

- Erf size 120 - 150sqm
TOTAL: 17 units
- Erf size 180 - 200sqm
TOTAL: 27 units
- Apartment Typology
TOTAL: 317 units
- TOTAL: 361 units



Figure 27 - Development Concept (Scenario 1)

Figure 28 - Development Concept (Scenario 2)

Site Concept
Option 3

- Residential Yard
- Single residential - 200 Units



Site Concept
Option 3

- Erf size 120 - 150sqm
TOTAL: 125 units
- Erf size 180 - 200sqm
TOTAL: 40 units
- TOTAL: 265 units



Site Concept
Option 4

- Residential Yard
- Single residential - 197 units



Site Concept
Option 4

- Erf size 120 - 150sqm
TOTAL: 125 units
- Erf size 180 - 200sqm
TOTAL: 75 units
- TOTAL: 197 units



Figure 29 - Development Concept (Scenario 3)

Figure 30 - Development Concept (Scenario 4)

3.5 Preferred Development Concept

The preferred development concept formed the basis of the detailed layout planning. As more detailed planning and investigations have been conducted, the development concept has been further refined and improved to culminate in the proposed subdivision layout plan that forms the basis of this rezoning/subdivision application.

The preferred development concept makes provision for a total of approximately 204 housing opportunities in a range of erf sizes that will target beneficiaries in the Gap and Flisp housing markets, as illustrated below:



Figure 31 - Development Concept with a Range of erf sizes

	Erf size 128 - 159sqm TOTAL: 124 units
	Erf size 160 - 200sqm TOTAL: 80 units

3.6 Housing Typologies

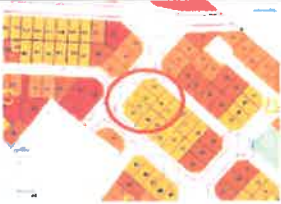
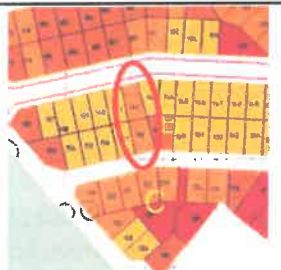
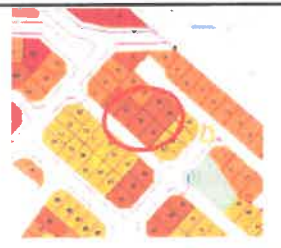
The subdivisional Layout plan makes provision for a range of housing types based on a range of erf sizes. The erf sizes have been grouped into five main size categories ranging from Small to XXL large (115sqm – 400sqm). Provision will be made for six different housing types that can be incorporated in the layout based on the sizes of the erven.

- o The erven classified as small and medium will accommodate semi-detached or row housing units where the units will share side boundaries between the units with 0m building lines along side boundaries.
- o The Medium sized stands could accommodate semi-detached or row housing units as well as freestanding houses.
- o The Large, XLarge and XXL large stands will accommodate freestanding houses.

Table 5 - Housing Typologies

Erf Size	Area	Semi/ Row	Freestanding	Corner / End	Middle
small	115 - 130	x		*1	*2
Medium	130 - 160	x	x	*3	*4
Large	160 - 185		*5		
X Large	185 - 220		*6		
XX Large	220 above		*6		

The 6 house types that will be made provision for are described in the table below:

House Type	Description	Example on Layout
1	*Semi-detached or row housing unit on a Small corner/end stand	
2	*Semi-detached or row housing unit on a Small middle stand	
3	*Semi-detached or row housing unit on a Medium corner/end stand	
4	Freestanding house on a Medium middle stand	
5	Freestanding house on a Large stand	
6	Freestanding house on a XLarge and XXL large stand	

Note:

* It is recommended that not more than 4 units be joined together as row housing units. If there are for instance a row of 5 adjoining stands, 3 row housing units can be constructed and 2 semi-detached units could be constructed.

If there are for instance a row of 6 adjoining stands, 4 row housing units can be constructed and 2 semi-detached units could be constructed, etc.

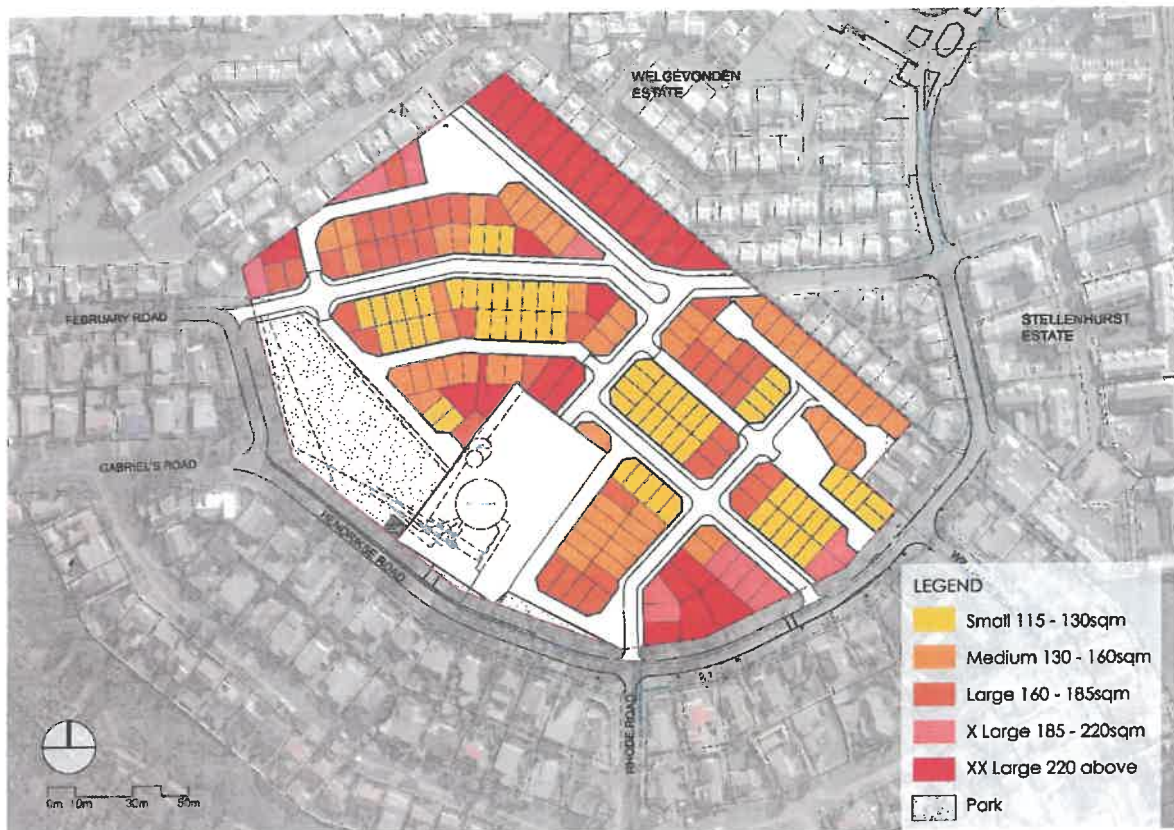


Figure 32 – Range of House Types to be incorporated on the various categories of stands

3.6.1 Housing Precedent

The preferred development concept will accommodate a range of one and two storey single residential or semi-detached / rowhousing units with front doors on street edge. This creates room for the buildings to define the streets as illustrated in the images below. Please note that it is recommended that the maximum number of units that are built next to each other as row-housing units should not exceed 4. The images below illustrate some examples of the type of housing that could be accommodated on the erven. The actual designs of the housing units will still be determined and confirmed during the detailed design stage and with further consultations with the Municipality.



Figure 33 - Typical Examples of Housing that could be developed



Figure 34 - Typical Examples of Housing that could be developed



Figure 35 - Typical Examples of Housing that could be developed

The below images are taken from the Welgevonded security estate directly adjacent to the site of development. These housing units are similar to the units that is envisaged to be constructed on the site, although it is foreseen that the proposed development will make provision for more affordable housing options for the GAP/FLISP housing market.



Figure 36 - Example of Row Housing and Semi-detached housing with stand sizes from the adjacent Welgevond Estate



Figure 37 - Example of Row Housing and Semi-detached housing with stand sizes from the adjacent Welgevond Estate



Figure 38 - Example of Row Housing and Semi-detached housing with stand sizes from the adjacent Welgevond Estate

4 APPLICATION PARTICULARS

The previous sections of this report has provided an overview of the site context and the various components of the site analysis undertaken to date, as well as an outline of the proposed development. Furthermore, previous sections of this report has detailed the potential impacts and the required approvals which will be needed for the legal implementation of the proposed development. In order to clarify the exact details of the application, this section will reiterate specifically what it is that is being applied for in this application.

An application is hereby submitted for the following:

- i. In terms of Section **15(2)(a)** of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2015, for the **rezoning of Erf 7001 Stellenbosch from "Public Open Space Zone" to a "subdivisional area"** in order to allow for the following uses:
 - 201 Conventional Residential Zone Erven
 - 4 Public Open Space Zone Erven
 - 1 Utility Services Zone Erf
 - Public Roads
 as shown on the proposed Subdivision plan (attached as **Annexure F**).
- ii. In terms of Section **15(2)(b)** of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2015, for a **permanent departure** from the development parameters of the zoning scheme.
- iii. In terms of Section **15(2)(d)** of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2015, for the **subdivision** of Erf 7001 in accordance with the attached Subdivision plan (attached as Annexure F), in order to give effect to the proposed land uses.
- iv. In terms of Section **15(2)(n)** of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2015, for the **closure of a part of a public space**.
- v. In terms of Section **15(2)(o)** of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2015, for **consent use** to erect a telecommunications mast on the portion to be zoned as Public Open Space Zone (Erf 205).

4.1 Proposed Rezoning

Application is made in terms of Section **15(2)(a)** of the Stellenbosch Municipality Land Use Management By-laws, 2015 for the **rezoning** of Erf 7001, Cloetesville from "Public Open Space Zone" to a 'Subdivisional area zone" in order to allow for the uses listed below, see subdivisional layout plan (**Annexure F**) attached for detail.

- 201 Conventional Residential Zone Erven
- 4 Public Open Space Zone Erven
- 1 Utility Services Zone Erf
- Public Roads

as shown on the proposed Subdivision plan (attached as **Annexure F**).

4.2 Proposed Departure from the development parameters of the zoning scheme

Application is made in terms of Section **15(2)(b)** of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2015, for a **permanent departure** from the development parameters of the zoning scheme, as set out below.

For the erven zoned as “**Conventional Residential Zone**”, application is made for the permanent departure from the development parameters of the zoning scheme for **provision of parking spaces** as well as **building lines**, as follows:

Departure from Minimum Parking Requirements:

Standard parking requirement:	2 bays per dwelling house for a house with 2 or more bedrooms
Application made for a reduction in the standard parking requirement (this application):	1 bay per dwelling house

The target market and associated lower car ownership for the future home-owners in this development, means that the minimum parking requirements could be reduced for the proposed development.

The central location of the site in close proximity to public amenities, economic opportunities as well as access to public transportation networks, also imply that a reduced number of private transport (car ownership) will be used by future home-owners in this development.

Departure from Standard Building Lines:

The standard building lines as per the development parameters of the zoning scheme for a **conventional residential zone** stand is as follows:

Area of land unit	Street boundary building lines (m)	Common boundary building lines (m)	Coverage	Height
Up to 250m ²	2m	1m (see 2(e) below)	70%	2 storeys
251m ² to 500m ²	3m	1m	The greater of 175m ² or 60%	2 storeys
501m ² to 1500m ²	4m	2,5m (see 2(c) below)	The greater of 300m ² or 50%	2 storeys
Greater than 1500m ²	4m	2,5m (see 2(c) below)	The greater of 750m ² or 40%	2 storeys

Application is made to reduce the standard building lines on all the **Conventional Residential zoned erven** to the following:

- street boundary building lines to **1 metre**
- the common boundary building lines (side building lines) to **0 metres**

A reduction in the standard building lines will enable the various semi-detached or row housing units illustrated under Section 3.6 of this report to be constructed and will enable the development to achieve the envisaged character described in the urban design framework.

The 8m road reserves are specifically chosen to create a series of shared 'living' streets. The development will accommodate a range of one and two storey single residential or semi-detached / row-housing units with front doors on street edge. A 'shared street' is a residential street designed to eliminate the separations between walking, cycling, and vehicular movement, enhancing the street's liveability. While cars are permitted, they are considered "guests" and yield to other modes and

activities. The shared surface design, typically a single surface with no level changes, disrupts the traditional hierarchy of mobility, naturally slowing down car movement, and allowing for a more efficient use of space. A reduction in the standard building lines will enable the development to achieve this envisaged character.

All the standard development parameters of the zoning scheme (Coverage, Height, etc.) will be applicable to the proposed development other than that for which is applied for in this departure application.

Note:

The approval of this application could be made subject to the approval of a Site Development Plan whereby the final placement of units, parking provision, building lines, coverage etc. will be confirmed.

4.3 Proposed Subdivision

Application is made in terms of Section **15(2)(d)** of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2015, for the **subdivision** of Erf 7001 in accordance with the attached Subdivision plan (attached as **Annexure F**), in order to give effect to the proposed land uses.

The subdivision of the erf in accordance with the attached Subdivision plan will create a range of residential stands, the street network and the utility erf for the municipal infrastructure.

The erf will be subdivided into 208 number of erven:

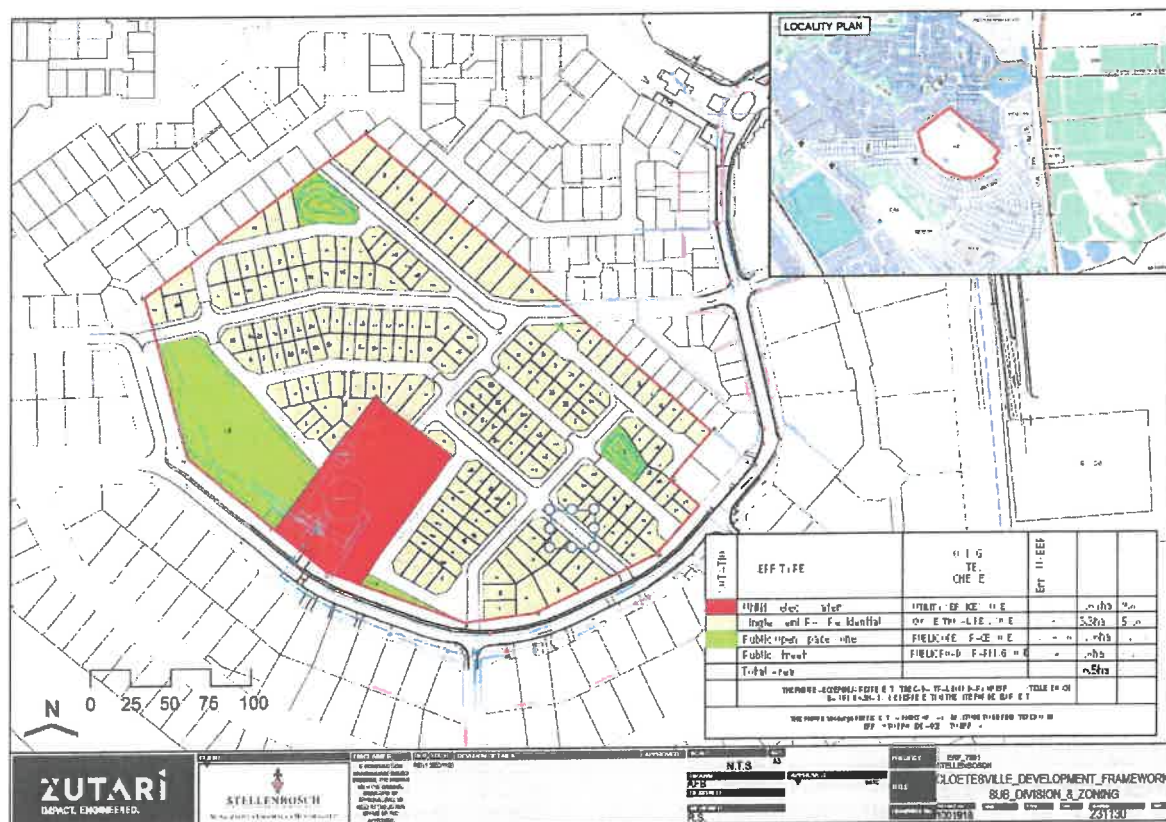


Figure 39 - Erf 7001 Stellenbosch Subdivision

The table below indicates the erf sizes of each of the proposed erven as per the proposed subdivision plan. A range of erf sizes are proposed ranging from approximately 120m² to 300m²:

Table 6 - Erf sizes as per Subdivision Layout Plan

Erf #	Area sqm	Erf #	Area sqm	Erf #	Area sqm	Erf #	Area sqm	Erf #	Area sqm	Erf #	Area sqm	Erf #	Area sqm
1	312	35	160	69	162	103	178	137	130	171	157	205	5866
2	291	36	160	70	134	104	223	138	131	172	144	206	8.4
3	291	37	119	71	129	105	201	139	140	173	160	207	6477
4	282	38	122	72	128	106	191	140	129	174	160	208	17921
5	281	39	128	73	126	107	224	141	128	175	160		
6	282	40	117	74	128	108	253	142	128	176	160		
7	282	41	131	75	126	109	159	143	128	177	185		
8	286	42	137	76	128	110	147	144	128	178	165		
9	286	43	145	77	126	111	198	145	128	179	142		
10	286	44	152	78	128	112	198	146	128	180	173		
11	286	45	126	79	125	113	197	147	128	181	138		
12	267	46	128	80	207	114	207	148	160	182	155		
13	269	47	128	81	185	115	401	149	243	183	158		
14	148	48	127	82	158	116	351	150	176	184	158		
15	143	49	126	83	128	117	157	151	127	185	156		
16	142	50	115	84	128	118	146	152	126	186	192		
17	167	51	128	85	128	119	146	153	125	187	183		
18	131	52	128	86	128	120	147	154	125	188	144		
19	156	53	115	87	130	121	137	155	148	189	160		
20	155	54	128	88	185	122	154	156	167	190	160		
21	155	55	128	89	157	123	151	157	128	191	160		
22	155	56	128	90	159	124	178	158	128	192	160		
23	155	57	128	91	154	125	278	159	128	193	151		
24	155	58	128	92	156	126	282	160	128	194	145		
25	155	59	128	93	150	127	149	161	128	195	128		
26	155	60	128	94	154	128	241	162	128	196	128		
27	154	61	128	95	145	129	299	163	200	197	128		
28	148	62	127	96	152	130	128	164	158	198	222		
29	160	63	127	97	141	131	131	165	158	199	263		
30	135	64	163	98	151	132	182	166	160	200	175		
31	160	65	160	99	162	133	177	167	246	201	220		
32	140	66	163	100	184	134	128	168	218	202	945		
33	160	67	163	101	178	135	129	169	169	203	548		
34	160	68	160	102	165	136	129	170	163	204	261		

4.4 Proposed closure of public space

Application is made in terms of Section 15(2)(n) of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2015, for the **closure of a part of a public space**.

A Status Report has been obtained from the Surveyor General's office which confirms that a portion of Erf 7001 is classified as a "public space" according to the Surveyor General's records, as per the area marked in Green in the image below. The area representing Erf 12214 was previously subdivided from erf 7001 and closed as a public space but the erf was never registered in the Deeds office and is therefore still legally part of Erf 7001. This application includes applying for the closure of a part of a public space in terms of Section 15(2)(n) of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2015, to enable the rezoning and subdivision of Erf 7001 Stellenbosch according to the subdivisional layout plan submitted with this application.

See the status report as received from the Surveyor General's office attached to this application as **Annexure I**.

R S A

Tel: (021) 487 4800
Fax: (021) 466 3008

DAVID HELLIG & ABRAHAMSE
PROFESSIONAL LAND SURVEYORS
PO BOX 910
CAPE TOWN
8000

2023-10-02

MY REF: STEL 81 v.6 p347

Your ref: S384/22
Dated: 2023-06-28

Note: THIS STATUS REPORT
IS VALID FOR 3 YEARS.

Attention: James Florence

Sir

**STATUS REPORT: CLOSURE OF REMAINDER OF PUBLIC PLACE ERF 7001
STELLENBOSCH**

- The proposed closure of land as shown coloured Green on your attached Diagram represents: **PORTION OF ERF 7001 STELLENBOSCH**
It is shown as a Public Place in my records.
- FOR OFFICE USE** The following properties will be endorsed: **ERYEN 7001, 8963, 8964 AND 12214 STELLENBOSCH AND GENERAL PLAN NO. 6489/1996**
- Enforcement fees amount to: R 900-00.
- I require a copy of a diagram suitable for registration purposes, surveyed and framed by a land surveyor, of the following: **N/A**
- A written consent (accompanied by a sketch) is required in terms of Section 23(1) of the Stellenbosch Municipality's Municipal Land Use Planning By-Law 2015 for the amendment of **GENERAL PLAN NO: N/A**

Yours faithfully


D CLOETE
For SURVEYOR-GENERAL: WESTERN CAPE

FOR OFFICE USE

CERTIFICATE:
GAZETTE No.
DATED: _____ p

Figure 41 - Surveyor General Status Report – Public Place

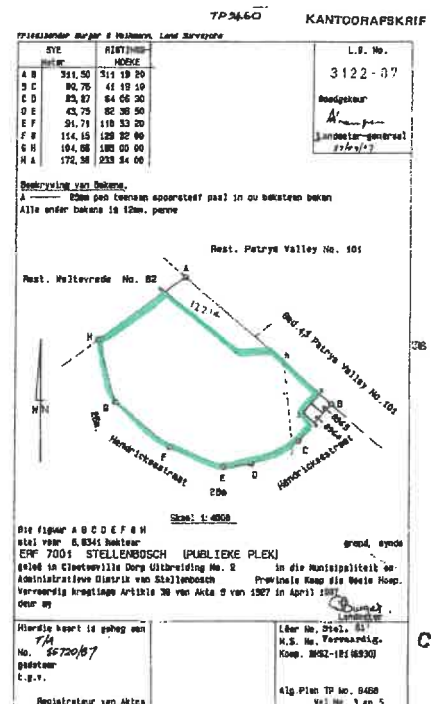


Figure 40 - Figure in Green represents public space as per Surveyor General's records

4.5 Proposed consent for the erection of a telecommunications mast on the proposed public open space erf (proposed erf 205).

Application is made in terms of Section 15(2)(o) of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2015, for a **consent use** to erect a telecommunications mast on the portion to be zoned as Public Open Space Zone (proposed **Erf 205**), (Consent use for a Freestanding base telecommunication station).

The site of application is regarded as ideal for the proposed telecommunication mast infrastructure due to its limited visual impact, health impact, and services impact. The proposed mast will be designed to look like a tree and will blend into the existing trees on the site. The mast will be located directly adjacent to the erf zoned for utility services that accommodates the water reservoir and does not have any adverse effects on the design of the proposed residential development.

The main purpose of the proposed telecommunication mast infrastructure is to improve the telecommunication network capacity of the area thereby facilitating economic trade in goods by bringing together buyers and sellers, but more importantly, also promote trade in services upon which modern economies are built. Communication is therefore essential for economic growth.

The proposed mast is designed to be located in an area to maximise the coverage area that the telecommunication mast infrastructure can reach, but also to minimise the impact to the receiving environment. Negative visual impacts and impacts on health and well-being are minimized by the proposed location of the mast as well as the proposed mitigation measures that will be implemented.

Refer to the illustrations below for an overview of the proposed design and position of the telecommunication mast infrastructure.

Also see the detailed design drawings for the proposed telecommunication mast infrastructure attached as **Annexure K**.



Figure 42 - Area of proposed Erf 205 (to be zoned as Public Open Space) where application is made for a consent use for the erection of a telecommunication mast infrastructure.

A 10 metre by 10 metre site is required for the proposed telecommunication mast infrastructure:

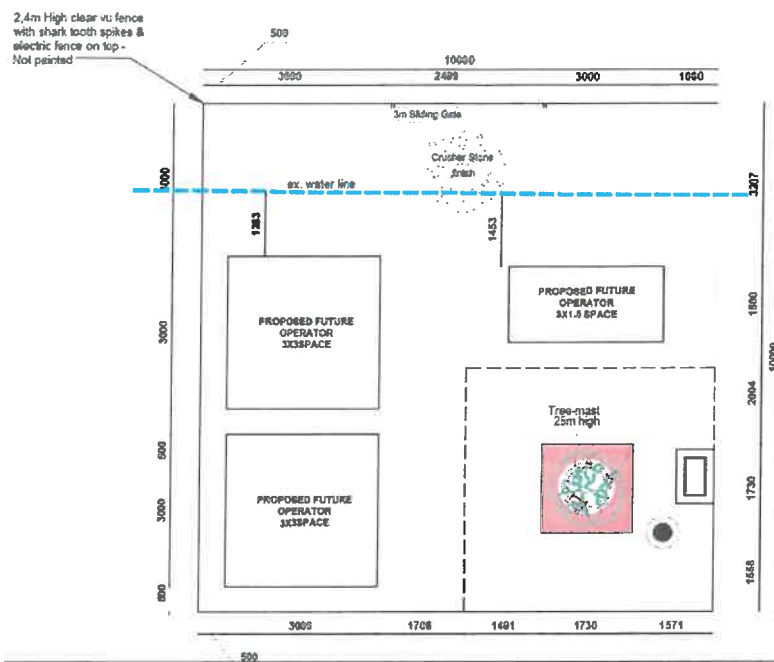


Figure 43 - Site planning for the 10m by 10m telecommunication mast infrastructure area

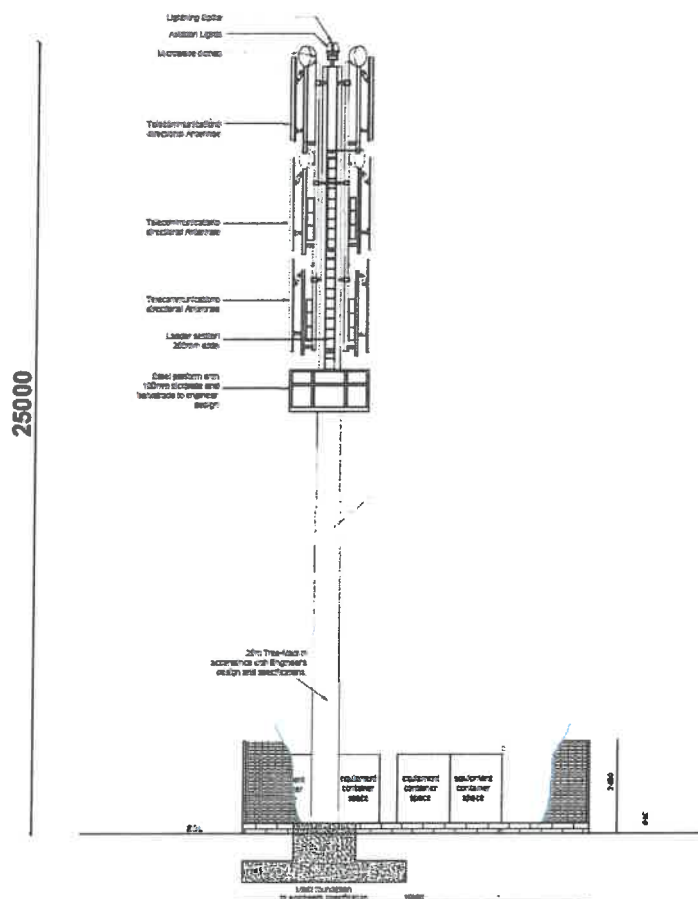


Figure 44 - Elevation of proposed telecommunication mast infrastructure

Refer to the detailed drawings of the proposed telecommunications mast attached as **Annexure K**.

4.6 Proposed land uses

The main objective is to undertake a Broad Conceptual Urban Design framework of Erf 7001, Cloeteville, Stellenbosch, to guide the development framework and to obtain town planning (Land Use Planning Rights) and development rights.

The particular goal of this project is the delivery of medium to upper (GAP) housing units. There is accordingly an urgent need for the Property to be developed so as to create an integrated urban development (Cloeteville), providing for housing choice together with appropriate economic and social amenities. The town planning and design principles have incorporated aspects of integration, designing for community safety, accessibility, and dignified spaces.

The site already accommodates a water reservoir and various municipal infrastructure which have been incorporated into an erf to be zoned as a utility zone. The remainder of the site has been planned to accommodate the proposed residential stands and streets. Due to the large number of trees on the site, a public open space has been included to retain a large number of these trees.

The proposed urban design framework of the Erf 7001, Cloeteville will therefore consist of the following projected land uses:

- ▶ Utility (elec & water)
- ▶ Single residential stands (Conventional Residential Zoning) which will cater for free standing single or double storey homes, single or double storey semi-detached units, and double storey row-housing units.
- ▶ Public open space
- ▶ Public Street

The proposed layout plan to subdivide Erf 7001, Cloeteville, Stellenbosch into the mentioned land uses is shown in **Annexure F** attached.

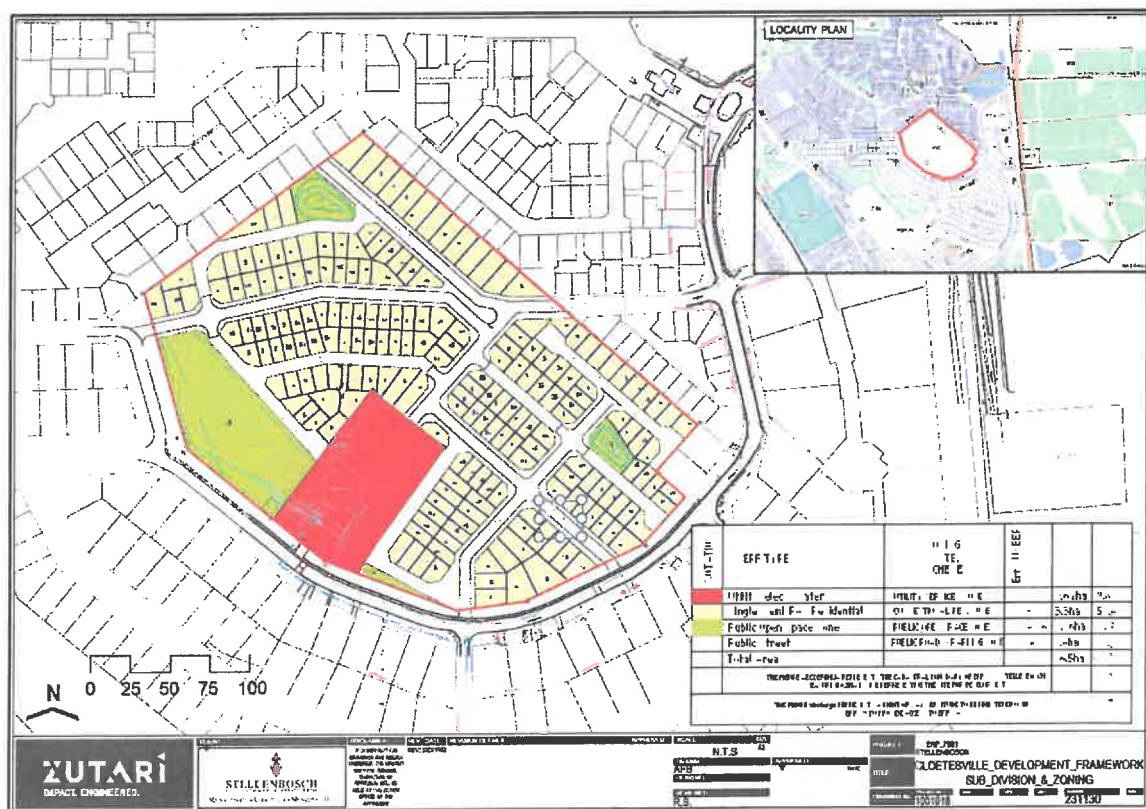


Figure 45 – Subdivisional Layout Plan

5 MOTIVATION

5.1 Land development principles

The proposal is consistent with existing Policy and Planning Frameworks and adheres to the principles of the Spatial Planning and Land Use Management Act, 2015 (Act No 16 of 2013) (SPLUMA). This application complies with the following General Principles for development as stated in Chapter 2 of the Spatial Planning and Land Use Management Act, 2013 (Act No 16 of 2013):

- Section 7 (b): The principle of spatial sustainability, whereby spatial planning and land use management systems must:
 - (vi) promote land development in locations that are sustainable and limit urban sprawl; and
 - (vii) result in communities that are viable;
- Section 7 (c): The principle of efficiency whereby:
 - land development optimises the use of existing resources and infrastructure.

The proposal also sets out to meet the land development principles referred to in Section 42 of the Spatial Planning and Land Use Management Act (Act 16 of 2013) (SPLUMA) and Chapter VI of the Western Cape Land Use Planning Act (Act 3 of 2014) (LUPA):

- Spatial justice
- Spatial sustainability
- Efficiency
- Spatial resilience
- Good administration

5.1.1 Spatial justice

The principle of spatial justice relates to redressing the past development imbalances to improve access to, and use, of land. The goal of the proposed integrated housing development in Cloeteville is to provide affordable housing opportunities (GAP / FLISP housing units), in a well located neighbourhood close to community facilities and economic opportunities. The provision of housing opportunities and services in the area is intended to service people of different races, cultural backgrounds, religions, etc. to bring about community and social cohesion.

5.1.2 Spatial sustainability

The principle of spatial sustainability relates to land use management systems that promote land development that is within the fiscal, institutional and administrative means of South Africa, must protect prime and unique agricultural land, and must comply with environmental laws and limit urban sprawl. The land identified for the proposed development is ideally located within the urban edge of the municipality and in an area that is earmarked for urban expansion according to the Spatial Development Framework, within an already established neighbourhood. This contributes to both spatial sustainability and spatial resilience.

5.1.3 Efficiency

The principle of efficiency relates to the optimal use of existing resources and infrastructure. The development of Erf 7001 will capitalise on the existing infrastructure. Such infrastructure includes the existing movement networks and bulk service connections. The development will also yield the least impact on the environmental resources of the area.

5.1.4 Spatial resilience

The principle of spatial resilience relates to the flexibility of spatial policies and land use management systems. The design of the development incorporates a maximum flexibility block approach to allow for street blocks to be broken up in different ways to accommodate varying approaches to land use, building typology and density. This flexible block approach creates room to accommodate changing needs over time.

5.1.5 Good administration

The principle of good governance relates to all spheres of government ensuring an integrated approach to land use and land development. The proposed development supports the principle of good administration as it is aligned to the overall strategic spatial development of the municipal area as indicated in the Stellenbosch Municipality Spatial Development Framework and the Integrated Development Plan.

5.2 Need and Desirability

5.2.1 Need

According to the Stellenbosch Municipality Integrated Development Plan (IDP) 2016/2017, "Stellenbosch faces a shortage of around $\pm 20\,000$ housing units".

In accordance with the housing need, Stellenbosch Municipality has identified the subject site for residential purposes. The particular goal of this housing development is the delivery of medium to upper (GAP) housing units.

There is accordingly an urgent need for the Property to be developed so as to create an integrated residential environment, providing for a range of housing opportunities and choice by catering for a mix of types of housing.

5.2.2 Desirability

Cloeteville is situated approximately 4km north of Stellenbosch on the R44 towards Paarl. Formerly known as Cloetesdal, the first phase of development started in 1964 it was finally included in the local municipality in 1967. In 1969 the first primary school was opened and today there are three primary schools and one high school. Other amenities include a library, theatre, swimming pool, sports complex and some guesthouses.

The proposed development of Erf 7001 will provide much needed housing to the local community, in an already established neighbourhood, utilising existing infrastructure. The community will as a result realize an increased sense of security and human well-being as the erf currently poses a threat of being invaded.

The proposed development will contribute to the character of the neighbourhood and will create much needed housing opportunities that are close to community facilities and economic opportunities.

5.2.3 Strategic Local and Provincial Planning Frameworks

The proposed housing development is aligned with strategic local and provincial plans. This section discusses the plans that are applicable to this application and their relation to the proposed development.

Provincial Spatial Development Framework

One of the objectives of the Provincial Spatial Development Framework is to promote urban and rural transformation. The NPC proposes a national focus on spatial transformation given the enormous costs imposed by existing spatial divides. It recognises that achieving this is a complex long-term process. The NDP's human settlement targets are:

- o more people living closer to their places of work;
- o better quality public transport; and
- o more jobs in proximity to townships.

To achieve these targets, it advocates strong measures to prevent further development of housing in marginal places, increased urban densities to support public transport, incentivising economic activity in and adjacent to townships; and engaging the private sector in the gap housing market.

Developing Integrated and Sustainable Settlements:

As a transversal instrument the PSDF embraces the concept of sustainable and integrated human settlements.

Settlement Policy Objectives

The Provincial settlement policy objectives are to:

1. Protect and enhance sense of place and settlement patterns
2. Improve accessibility at all scales
3. Promote an appropriate land use mix and density in settlements
4. Ensure effective and equitable social services and facilities
5. Support inclusive and sustainable housing

The protection and enhancement of heritage and cultural resources is a clear Provincial mandate with indirect but strong links to its economic development mandate, especially with respect to skills retention in the knowledge economy.

The proposed development therefore aligns with the objectives of the Provincial Spatial Development Framework.

Stellenbosch Spatial Development Framework

According to the Stellenbosch Municipality Spatial Development Framework, 2019, the area of the proposed development is located within the urban edge and is earmarked for development:

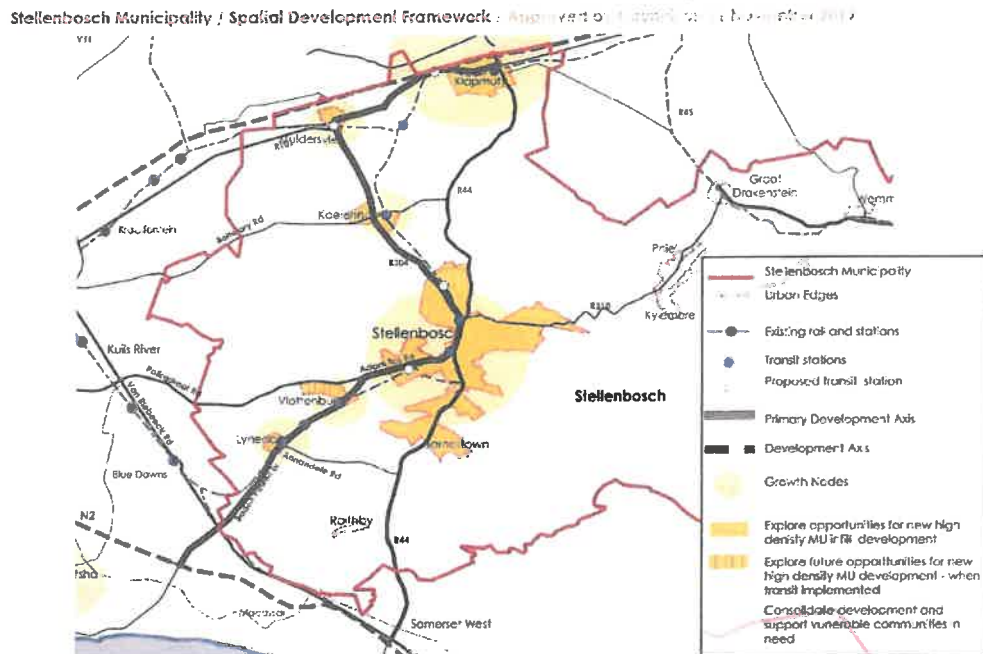


Figure 46: Map adapted from Stellenbosch Municipality SDF, 2019 - indicating that the land is located within the urban edge and earmarked for development ("explore opportunities for new high density infill development")

The Stellenbosch Municipality Spatial Development Framework, 2019, also earmarks the area to be developed for **"Mixed-use Community and Residential in-fill"**:

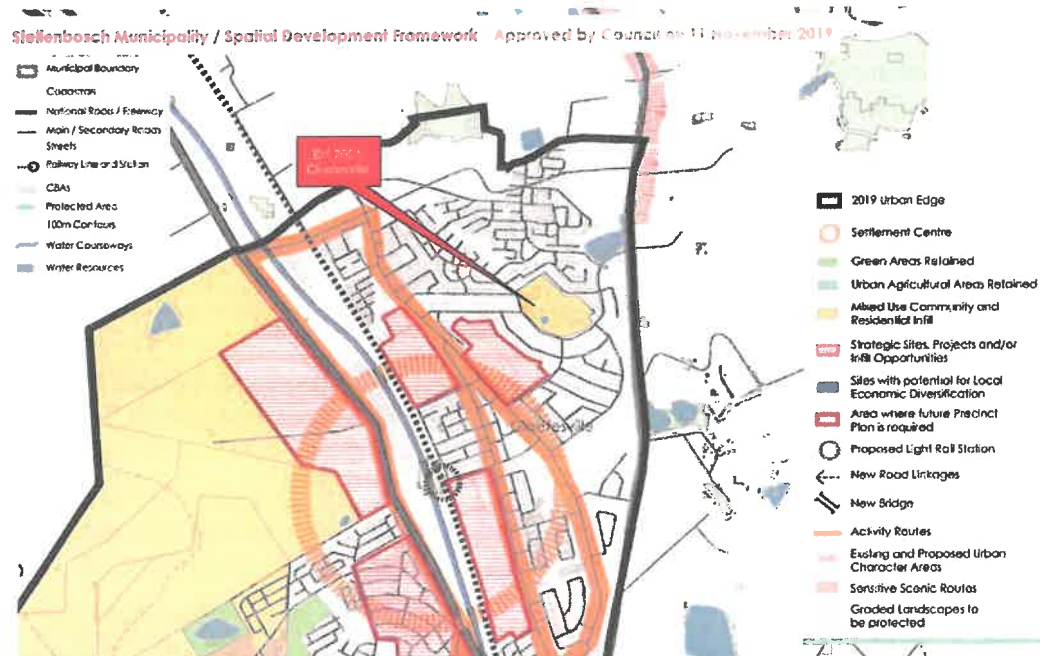


Figure 47: Map adapted from Stellenbosch Municipality SDF, 2019 - indicating that the land is earmarked for Mixed-use Community and Residential in-fill.

The proposed development therefore aligns with the objectives of the Municipal Spatial Development Framework.

Integrated Development Plan (IDP)

Some priorities identified in the IDP of the Municipality includes the development of housing:

- *The burning issue of housing for our residents in all categories remains of utmost importance. All categories from rental stock, BNG, GAP housing, upgrade of informal settlements and mixed-use developments. We shall seek every possible opportunity in all ten dorpias across the municipality;*
- *Focus on social housing and gap housing to address the plight of backyarders and to provide dignified living opportunities to as many residents as possible;*

The provision of housing is also identified as a Strategic focus area in the IDP

Strategic Focus Area 4: Dignified Living

All our citizens should have access to a dignified life, irrespective of their relative material wealth or their background. By a dignified life, we mean, inter alia, access to shelter, ethical administration of municipal housing, and sufficient choice in housing opportunity for different income groups, including young people. We also mean neighbourhoods with accessible public facilities and services. Support for vulnerable groups, including the youth, women and the elderly is critical, as is a close working relationship with other government and social agencies that focus on the needs of these groups.

The Cloetesville development is listed as a project in the IDP:

5th Generation Integrated Development Plan 2022 - 2027



Project / Programme / Initiative	Responsible Internal Department / Agency	Action/s	Estimated Funds
Mega-human settlement project monitoring	Department: Housing Development	Kayamandi Town Centre: To obtain development rights/township establishment.	R2 000 000
		Jamestown: Housing (Phase 2, 3 and 4): To obtain development rights/township establishment.	R1 500 000
		Erf 7001 and other possible sites for mix-used development in Cloetesville: To obtain development rights/township establishment.	R1 000 000

Figure 48 - Stellenbosch Municipality IDP - 2022 -2027

DIRECTORATE: PLANNING AND ECONOMIC DEVELOPMENT																	
IDP Ref	Responsible Department	Key Activity/ Project/ Programme/ Initiative (measurable action)	Description of Unit of Measurement	Project Phase	Number of Housing Opportunities	5-year target 2022 - 2027	Year 1 Target	Year 2 Target	Year 3 Target	Year 4 Target	Year 5 Target	Funding Type	Progress Rating				
							2022/23	2023/24	2024/25	2025/26	2026/27		2022/23	2023/24	2024/25	2025/26	2026/27
TSC	PMU	Upgrading of Zone Q in Kayamandi	Percentage of the Zone Q (in Kayamandi) capital budget actually spent by 30 June	Construction will be done w/m in phases	711	90%	90%	90%	90%	90%	90%	9	n/a	n/a	n/a	n/a	n/a
TSC	Housing Development	To obtain development rights on Erf 7001, Cloetesville to establish GAP housing	Percentage of the Erf 7001, Cloetesville capital budget actually spent by 30 June	Planning	360 GAP housing	90%	90%	90%	n/a¹	n/a¹	n/a¹	8	n/a	n/a	n/a	n/a	n/a

Figure 49 - Stellenbosch Municipality IDP - 2022 -2027

5.2.4 Location and accessibility of the property

Erf 7001 is within the established Cloeteville neighbourhood that is close to community facilities and economic opportunities and access routes. The site is ideally located for the proposed development.

5.2.5 Physical characteristic of the property

The site is vacant with no man-made elements (e.g. building/structures) except for the municipal water infrastructure that will be accommodated in the utility erf. The site is unfenced and features low sensitivity botanical resources. The slope of the site is gentle. There are no areas of conservation value or sensitivity that could be impacted by the proposed development. The physical characteristic of the property is therefore suitable for the proposed development.

5.2.6 Environmental Impact

An environmental due diligence study for Erf 7001, Cloeteville site was conducted by Guillaume Nel Environmental Consultants, to identify any potential environmental constraints that could impact on the developability of the site. The findings of this study are discussed below.

Vegetation

According to Cape Farm Mapper, a small portion of the site is mapped as a Terrestrial CBA, predominantly covered by Swartland Shale Renosterveld vegetation. During a site visit, no natural indigenous vegetation was noted on site and the groundcover consisted out of small patches of Bermuda grass and weeds as shown in the figure below Figure 51. The site does not bear any ecological relevance as the entire site shows signs of disturbance based on the lack of natural vegetation present. Therefore, based on the site inspection, the sensitivity of the site is considered low, and the proposed development is not expected to have a considerable detrimental effect on the environment.

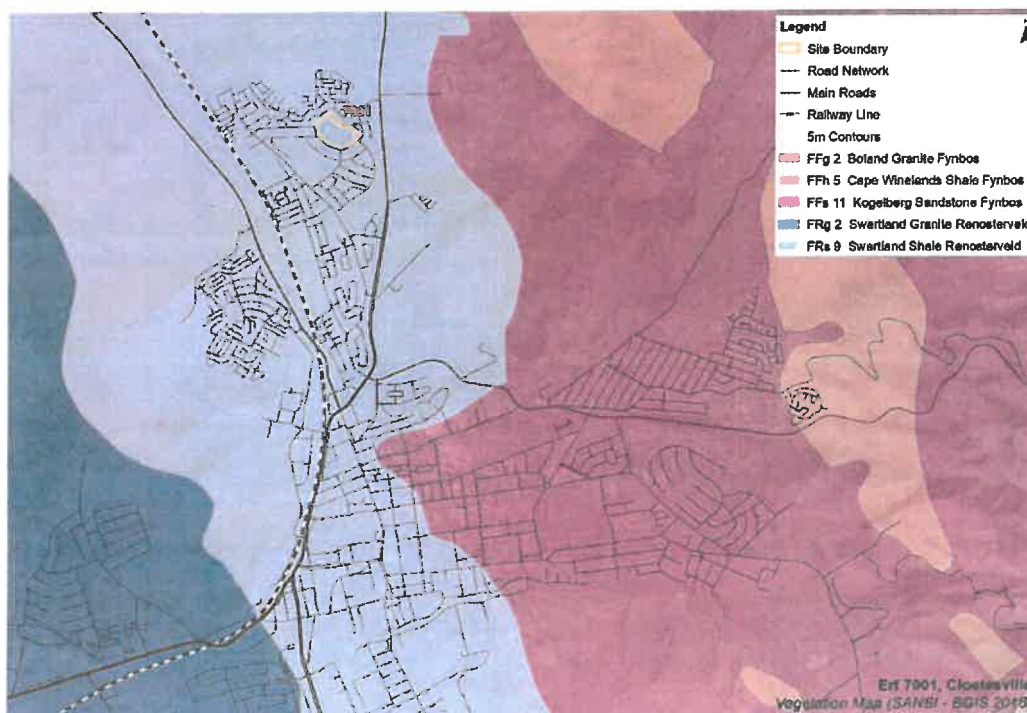


Figure 50: Vegetation map



Figure 51: Photo of Bermuda grass and weed on the site

A large amount of pine trees was noted on site; however, these trees are not considered to have high conservation value due to them not being indigenous to South Africa. The figure below shows pine trees on the site.



Figure 52: Pine trees on the site



Figure 53 - Tree mapping

Freshwater Sources

There are no freshwater sources and wetlands on the site as indicated in the figure below. The only aquatic feature on site is a water reservoir and associated tower which is utilised by Welgevonden Estate and will be retained as part of the development. Furthermore, the proposed site is not in close proximity to the ocean. The Plankenburg River is located approximately 1km from site and its associated tributary 700m with no expected impacts stemming from the development.

Therefore, it is not expected that the proposed residential development will have any impact on aquatic resources due to the lack of natural aquatic resources on site.



Figure 54: Watercourses map (No water courses present)

Cultural Heritage and Archaeology

Heritage and archaeology were also taken into consideration during environmental investigations. The only structures identified on the site are shown in the figure below, a water reservoir and tower in the

centre of the site. None of these structures are deemed to be of historic and architectural value. No other elements located in the surrounding environment are considered to be a heritage resource. An NID was submitted to HWC on the 18th of January 2019 and a positive ROD was received on the 31st of January 2019.

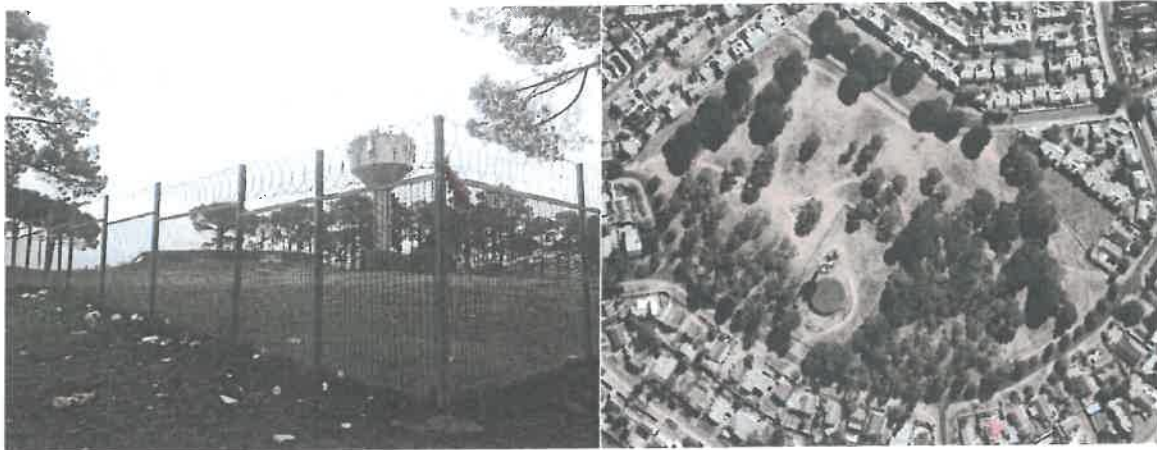


Figure 55: Water reservoir and tower

5.2.6.1 Environmental Authorisation

A Letter from the Western Cape Department of Environmental Affairs and Development Planning (DEADP), dated 3 August 2022 was received whereby it was confirmed that environmental authorisation is not required for the proposed development:

“...the proposed low-cost housing development on the abovementioned property, does not constitute any listed activities as defined in terms of the NEMA EIA Regulations 2014 (as amended). Environmental Authorisation is therefore not required prior to the proposed development.”

See the letter attached as **Annexure L**.



Department of Environmental Affairs and Development Planning
D'niel Matthews
Directorate, Development Management, Region 1
D'niel.Matthews@westerncape.gov.za | Tel: 021 4868880

REFERENCE: 16/3/16/1/54/5/1246/22
DATE: 30/03/22

The Director
Guillaume Nel Environmental Consultants
P. O. Box 2632
PAARL
7620

Attention: A. Groot

Tel: (021) 870 1674
Email: a.p@gne.co.za

Dear Sir

RE: APPLICABILITY OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) ("NEMA") ENVIRONMENTAL IMPACT ASSESSMENT ("EIA") REGULATIONS, 2014 (AS AMENDED), WITH RESPECT TO THE PROPOSED LOW-COST HOUSING DEVELOPMENT ON ERF 7001, CLOETEVILLE

1. The electronic correspondences dated July 2022, as received by this Department on 4 July 2022, refer.
2. Following the review of the new contained in the electronic correspondence, this Department notes the following:
 - 2.1.1 The proposal entails the construction of a low-cost housing development on Erf No. 7001. The property is currently zoned as a utility services zone as the Welgevonden reservoir is situated in the centre of the site. The development footprint of the low-cost housing will be approximately 59 550m² and the remainder of the site will continue to be occupied by the water reservoir and associated water tower footprint (5785m²).
 - 2.1.2 According to aerial imagery available to the Department, the site has been used for and zoned for utility services. The site is therefore regarded as being inside the urban area.
 - 2.1.3 The site would have been comprised of Swartland Shale Renosterveld, an ecosystem listed as critically endangered in terms of Section 62 of the National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) ("NEMBA"), however, the site has been transformed and no longer contains indigenous vegetation.
 - 2.1.4 There are no waterbodies present on site.
3. Your attention is therefore drawn to the listed activities in terms of the NEMA EA Regulations 2014 (as amended) as defined in Listing Notices ("LN") 1, 2 and 3 of 7 April 2017. Be advised that, based on the information provided, the proposed low-cost housing development on the abovementioned property, does not constitute any listed activities as defined in terms of the NEMA EA Regulations 2014 (as amended). Environmental Authorisation is therefore not required prior to the proposed development.



www.westerncape.gov.za
Department of Environmental Affairs and Development Planning

Figure 56 - DEADP Letter confirming that no environmental authorisation is required

5.2.6.2 Geotechnical Conditions

A geotechnical study of Erf 7001 was conducted by Kantey and Templer Consulting Engineers. The study involved the following investigation:

- Desktop study of the available geological data, aerial imagery and previous reports;
- Inspection of existing soil exposures in the vicinity;
- Excavation of a series of machine dug trial holes across the development area. The holes will be taken to depths of up to 2,5-3,0m below existing ground level, subsoil conditions permitting;
- Dynamic Cone Penetrometer testing at the trial holes;
- Assessment of subsoil conditions by detailed inspection of the materials exposed in the trial holes and evaluation of the penetrometer test results;
- Extraction of soil samples from selected trial holes for laboratory testing; and

No adverse geotechnical conditions were found which could hamper the developability of the site.

A Geotechnical Report including recommendations related to the subsoil profile, subgrade conditions, groundwater conditions, materials utilisation potential, excavation conditions and founding conditions are provided and the findings and recommendations of the study will be incorporated into engineering designs.

See the Geotechnical Report attached as **Annexure M**.

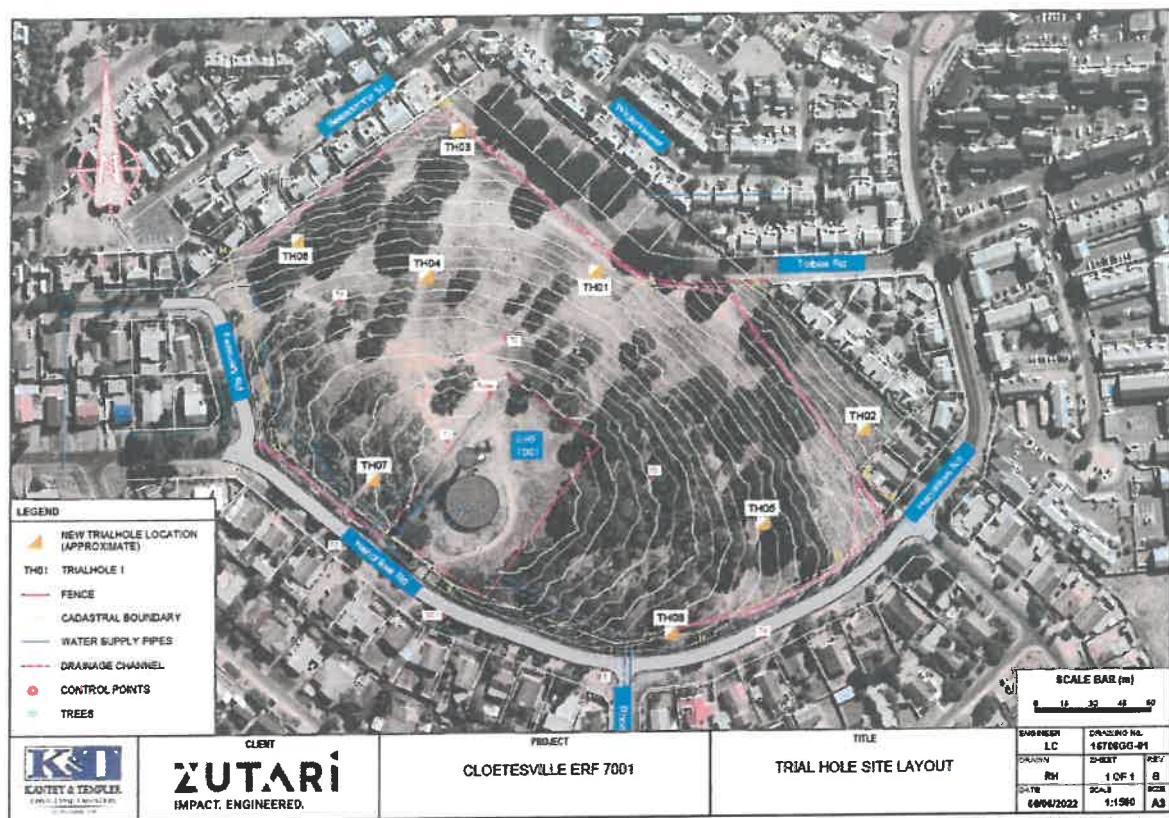


Figure 57 - Position of trial holes

5.3 Engineering & Bulk Services

5.3.1 Water Infrastructure

Cloetesville is currently supplied with water from the existing 2.8 ML Cloetesville Reservoir and 50 kl Cloetesville Tower. There is insufficient capacity in the existing water reticulation system to accommodate the proposed development.

The following bulk network upgrades will be required:

- New 7.0 ML Reservoir top water level at 188.0m;
- Upgrading of existing pumps from the reservoir to the water tower;
- Upgrading of existing pumps from the Idas Valley reservoir to Uniepark Reservoir which feeds the existing Cloetesville reservoir.

The potable water demand for the proposed development was calculated based on The Redbook, which recommends 0.40 kl/day/unit for high density group housing with an erf size between 130m² and 200m², 0.45 kl/day/unit for medium density group housing with a size between 200m² and 270m² and 0.3 kl/day/unit for low-income housing high density erven above 270m².

See the services report attached as **Annexure N**.

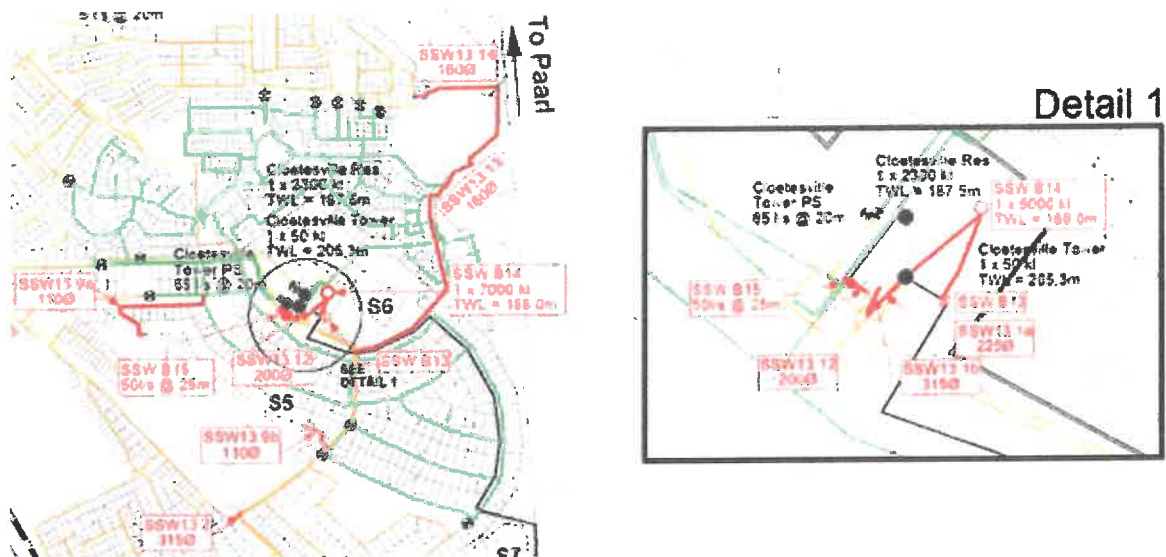


Figure 58: Bulk water upgrades (GLS Master Plan)

5.3.2 Sewer Infrastructure

The general Cloetesville area drains to the existing Adam Tas Main Sewer Works.

There is sufficient capacity in the existing sewer reticulation system to accommodate the proposed development.

The following bulk network upgrades will be required:

- Upgrading of the bulk sewer line from Kayamandi to Merriman Street.

The development will typically have high density residential irrigation demands. Each conventional stand will have a small garden and grass area. Therefore, the percentage of potable water demand which will be converted to sewage yield was estimated as 90% to 95%.

It can be concluded that the additional annual average wet weather sewage flow yield generated by the proposed future development is 82.4 kl/d. The instantaneous sewage peak flow is calculated as 2.4 l/s.

A conventional uPVC Class 34 waterborne sewage system with a minimal diameter of 160 mm will be installed with connections to each erf. A layout of the preliminary sewer network is shown in Figure 4.

According to the Crimp & Bridges Tables the maximum capacity of a 160 mm uPVC pipe at 1:150 slope is 14.1 l/s. Considering the calculated peak sewage flow from the proposed development 2.4 l/s, a 160 mm uPVC network is sufficient.

No onsite sewage settling, or treatment will be done. All sewage will be directed towards the municipal bulk sewage network where it will be treated and discharged as per the municipal sewage management plan which has sufficient capacity to treat the raw sewage flow.

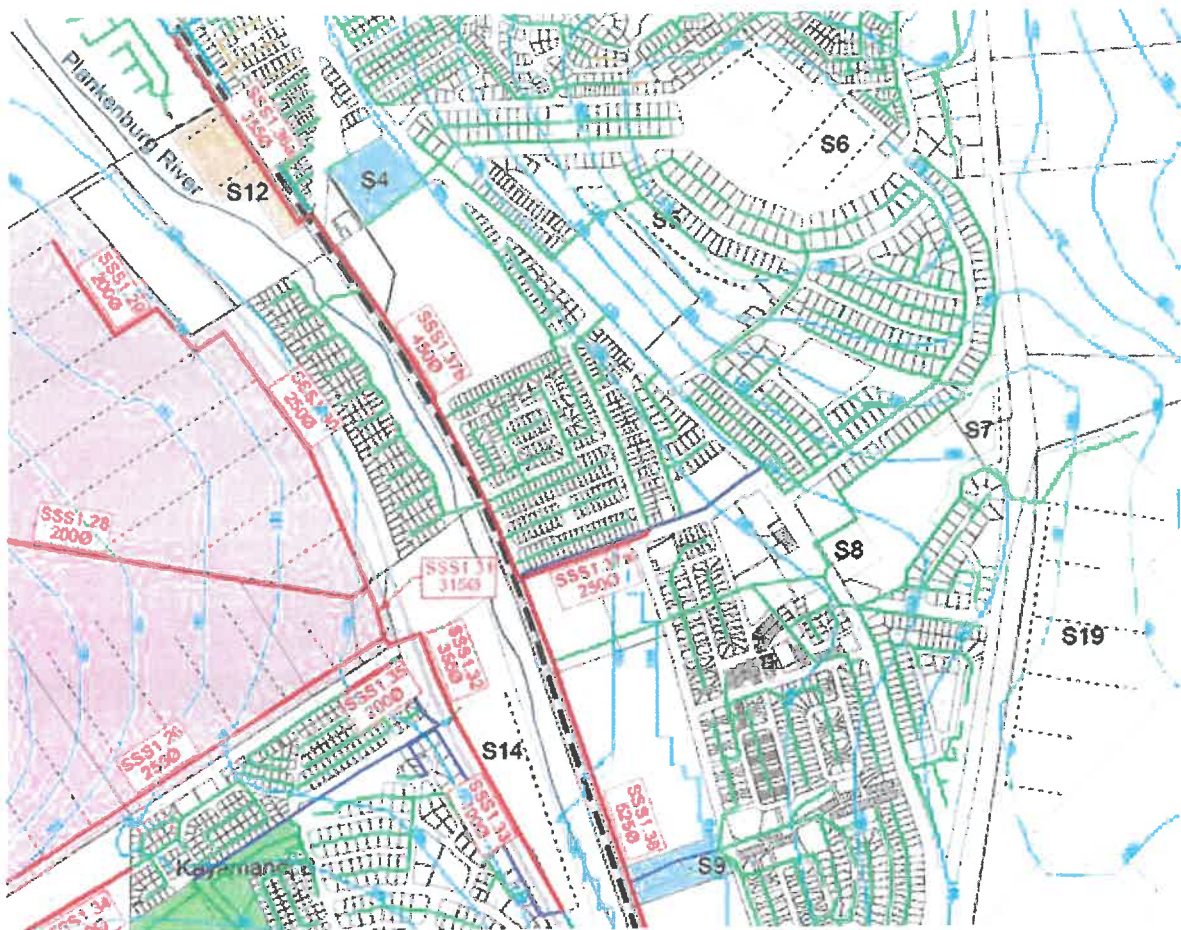


Figure 59: Bulk Sewer Upgrades (GLS Master Plan)

5.3.3 Stormwater

The site vegetation predominantly comprises of low grasses and scattered concentration of mature pipe trees. The in-situ soil conditions are semipermeable shales of Malmesbury Group which is mantled by residual and transported soils of various thickness. The majority of the site drains to the north where a cut-off earth channel directs the water to an existing headwall connected to the existing municipal system in the northern corner of the site.



Figure 60: Drainage routes

The standard stormwater guidelines for residential developments as per CSIR (2005), and Drainage Manual (SANRAL, 2013), was used for the design of the proposed new internal stormwater system.

Specific attention will be given to the following:

- Stormwater run-off will be calculated using the Rational Method;
- Minor flows: Stormwater will be conveyed to stormwater grid/side inlets and formally piped to safe discharge points / detention dams;
- Major flows: Safe overland flow directed to the proposed detention dam will be allowed for;
- For various recurrence interval (RI) storm event, the peak run-off after development will not exceed the peak run-off prior to development.
- Temporary stormwater management measures will be implemented and adhered to during construction.

The proposed stormwater design concept will comprise of smaller subdivided catchment areas conveying runoff generated from roads and erven to grid inlets and ultimately into detention ponds via the stormwater network. Attenuation of the difference between the pre- and post-development peak flows will be accommodated in the two detention ponds. Catchment 1 (eastern catchment) will drain to detention pond 1 which has a volume capacity of 240m³. The area north of pond 1, is lower laying and will not be able to drain to pond 1. Instead, this area will drain to the north and connect to the existing system in Tolbos road. Pond 1 will have a variable outlet system only allowing pre-development flow rates out into the existing system connected in Hendrikse Road. Catchment 2 (western catchment) will drain to detention pond 2 which has a volume capacity of 410m³. Pond 2 will have a variable outlet system only allowing pre-development flow rates out into the existing system via the headwall in the northern corner of the site. The figure below illustrates the proposed stormwater network and catchment areas.



Figure 61 - Proposed post-development stormwater network

Stormwater detention ponds have been incorporated into the design of the subdivision layout plan and will assist in the management of stormwater during periods of rain:

The detention ponds can be used as play areas for members of the community in times when its not raining, as illustrated in the images below:



Figure 62 - Examples of stormwater detention areas designed to be used as recreational spaces in times when its not raining



Figure 63 - Examples of stormwater detention areas designed to be used as recreational spaces in times when its not raining

5.3.4 Solid Waste

All waste generated from the residential units of the proposed development, will be temporarily stored in storage bins. The municipality will collect all bins from an appropriate refuse areas or individual erven on the transport it to a Waste Disposal Site as determined by the Municipality. The position of the refuse areas (if applicable will be placed at a practical area with easy access for the Municipal Solid Waste Disposal Trucks of the Municipality. No access control will be used in the development. Stellenbosch Municipality has sufficient capacity available for the development.

5.3.5 Electrical Services

Stellenbosch Municipality's main electrical supply is fed from Eskom. The registered notified municipal demand agreement with Eskom is currently 16MVA firm capacity. The closest point of supply to the site is the existing Welgevonden Switching station via the existing Cloetesville's 66kV/11kV Substation which consists of 2x 20MVA transformer units. The main Cloetesville substation is located 700m southwest of the Erf 7001.

It has been confirmed that the network in the area will have sufficient capacity for the development of Erf-7001.

See the Electrical Services Report attached as **Annexure P**.

The figure below illustrates the Stellenbosch Municipality bulk electrical network.

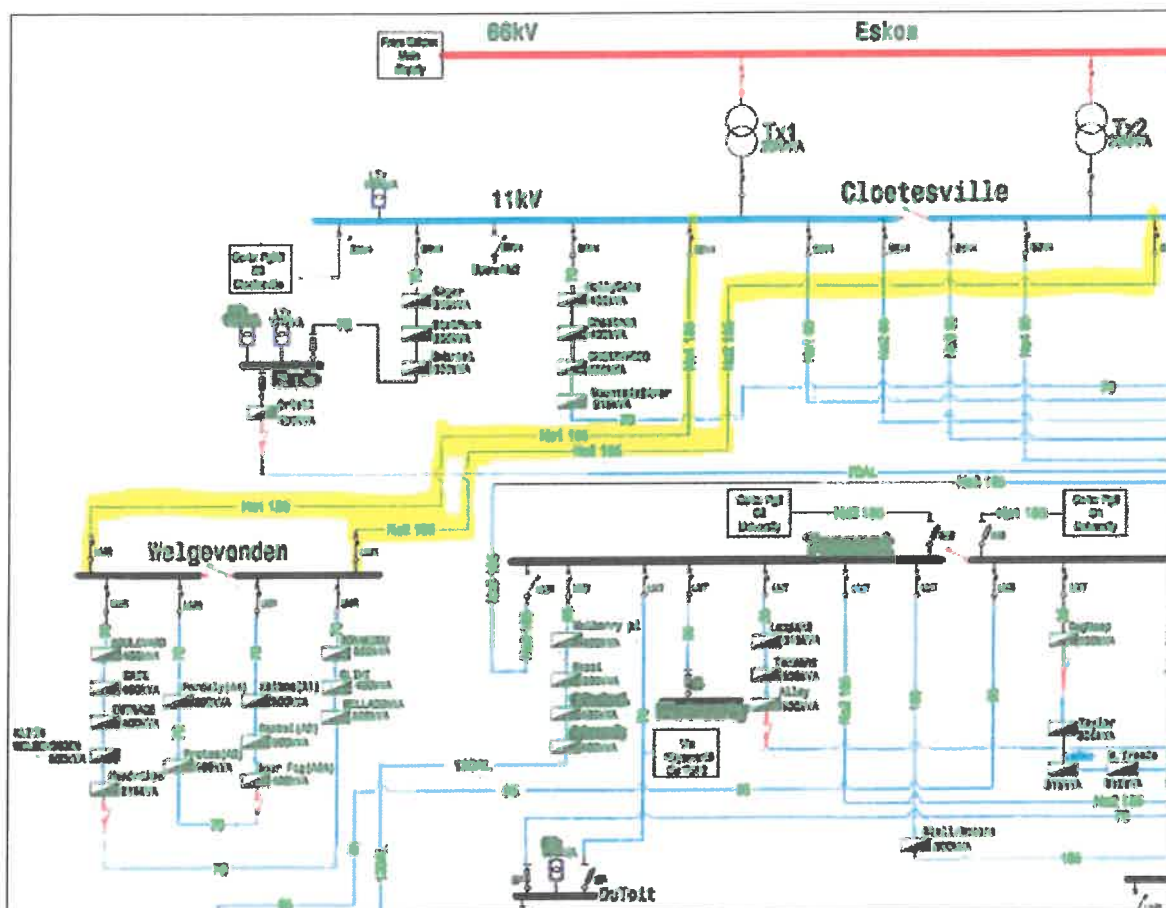


Figure 64: Stellenbosch Municipality bulk electrical network



Figure 65: Electrical network surrounding the site

The Municipality is currently in discussion with Eskom to increase their current N.M.D from 16MVA to a 20MVA as an interim solution to relieve the current bulk capacity constraints. A master plan was previously conducted for Stellenbosch Local Municipality and medium density housing was allowed for. This catered for 90 units with a loading of 315-500kVA. Current development proposals include the

development of medium to high density multistorey residential units which will increase the load demand that was previously projected. Bulk service contribution

Using the current bulk service tariff for 2022/23, the total estimated bulk service contribution for a potential 200 units could be in the region of R3,423.82 ex VAT per kVA (R3,937.39 incl. VAT), as illustrated in the table below. The exact number of units and associated expected demand will only be confirmed once the detailed planning for the site has been completed.

Table 7: Expected Maximum Demand Breakdown (based on preliminary projected land use)

No	Potential land uses	Units	Total Required Demand (kVA)	Bulk Contribution Tariff (R/kVA)	TOTAL (kVA)
1	Gap / Flisp Housing	100	500	R3,423.82	R1,711,908.70
2	Gap / Flisp Housing	90	450	R3,423.82	R1,540,717.83
4	Parks	2	5	R3,423.82	R17,119.09
Anticipated Bulk Contribution Amount (VAT Excluded)					R3,269,745.62
VAT					R490,461.84
Anticipated Bulk Contribution Amount (VAT Included)					R3,760,207.47

MINIATURE SUBSTATIONS:

The provisional load-calculations indicate that 2 x miniature substations will be required to supply the calculated low-voltage load. The exact positions can not be fixed now, but will be in the vicinity of the 2 x blue blocks included on the drawing in the figure below:



Figure 66 - Indicative positions of electrical substations

The minisubs will not require separate erven to be registered. We indicated one in the remaining POS-area, and the other in the water-reservoir area (can also be moved to the road-reserve outside the reservoir area).

Each minisub position will be 6x4m dedicated for the minisub.

See the Electrical Services Report attached as **Annexure P**.

5.3.6 Transport Planning

The layout of the roads is shown on the attached subdivision layout drawing. These roads are planned to be an appropriate width to match those in Cloetesville and the greater Stellenbosch area. The roads will be constructed with grade no flatter than 1 in 200. All roads will be designed to municipal standards. The roads will be designed to be able to effectively discharge stormwater run-off during major flood events.

An analysis of the existing road network and road hierarchy was undertaken. The site was also evaluated for the following basic traffic and transportation considerations:

- Access routes and the roads that will likely be affected;
- Public transport and private vehicle trips; and
- An estimation of the trips that will potentially be generated by the development.

See the Traffic Impact Assessment Report attached as **Annexure O**.

5.3.6.1 Road Network

R304 is classified as a Class 2 Primary Arterial, it is one lane per direction, with turning lanes at intersections, paved shoulders and sidewalks along Kayamandi.

R44 is classified as a Class 2 Primary Arterial, it is dualled from Stellenbosch and becomes one lane per direction further north, with turning lanes at intersections, paved shoulders and sidewalks along the roadway from Stellenbosch to Hendriks Road. The road also allows for the North-South connectivity, Stellenbosch to the South with Wellington to the North.

It is assumed that access may be onto Hendrikse Road in the South; OR February Road in the East; OR Tolbos Road in the North. Hendrikse Road functions as a distributor as it connects to the R44 and the other two roads are class 5 residential streets, approximately 6 to 7m wide and with sidewalks only along the north of Hendrikse Road. Traffic calming facilities are also provided along Hendrikse Road.

5.3.6.2 Traffic and Transport Considerations

Transport planning investigations included traffic counts at various intersections. The intersection performance, in terms of delay and level of service, will be impacted by the additional of peak hour trips to the network. Peak hour traffic counts at seven (7) intersections in Cloetesville, Stellenbosch were conducted on a normal workday between 7:30:00-08:30 and 17:00-18:00.

- ▶ Intersection 1: R44 / Hendrikse Road (*Traffic Control Signal*)
- ▶ Intersection 2: Hendrikse Road / Tolbos Road (*All-Way Stop*)
- ▶ Intersection 3: Hendrikse Road / Williams Road (*All-Way Stop*)
- ▶ Intersection 4: Hendrikse Road / Rhode Street (*Priority Yield*)
- ▶ Intersection 5: Lang Road / Gabriels Road (*All-Way Stop*)
- ▶ Intersection 6: Lang Road / Welgevonden Blvd (*Priority Stop*)
- ▶ Intersection 7: R304 / Welgevonden Blvd (*Traffic Control Signal*)

The figure below indicates intersection locations where the counts were conducted.

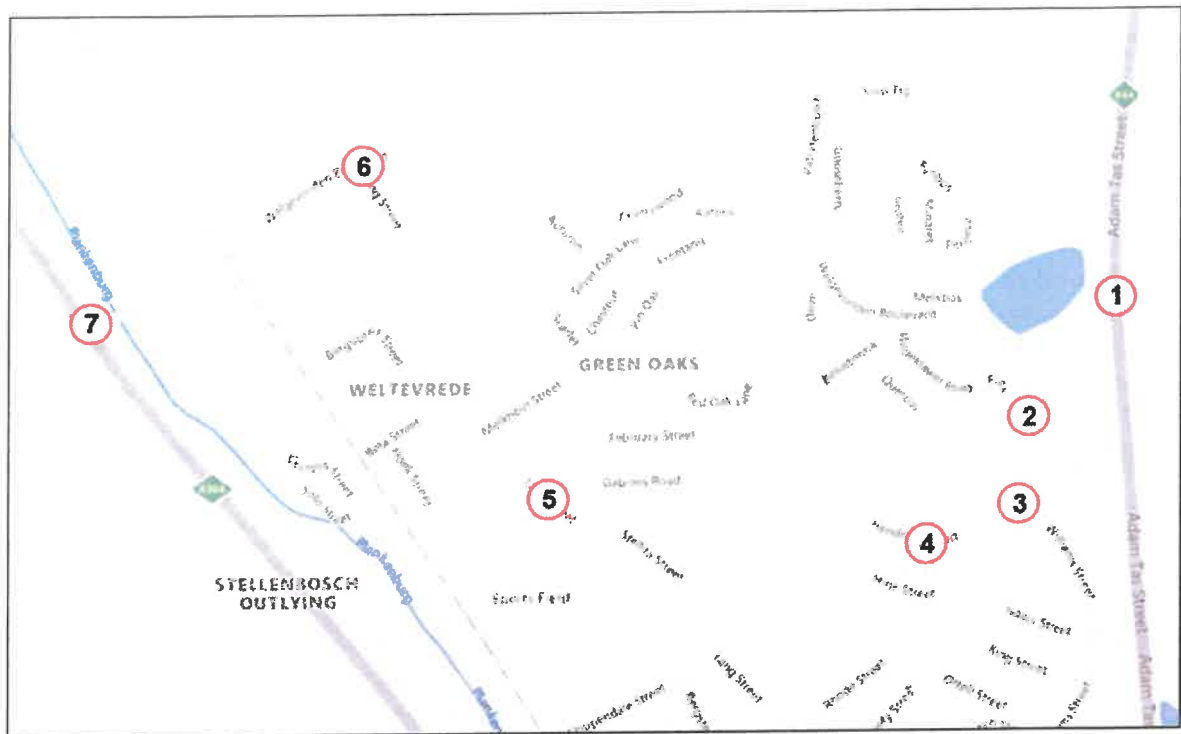


Figure 67: Key intersections

Table 8: Traffic counts

Int No.	Intersection Name	Peak Period	Delay (sec)	V/C Ratio	Intersection Level of Service	Approach Lsg. Level of Service			
						South	East	North	West
1	R44 / Hendrikse Road Traffic Signal	AM	108	1.057	F	E		F	F
		PM	21.2	0.865	C	B		A	E
4	Hendrikse Road / Tolbos Road All-way stop	AM	14.8	0.306	B	B	B	B	E
		PM	32.5	1	C	B	C	C	F
3	Hendrikse Road / Williams Road All-way stop	AM	13.5	0.222	B	B	B		B
		PM	13	0.252	B	C	B		B
4	Hendrikse Road / Rhode Street Yield on southern side	AM	0.8	0.09	A	A	A		A
		PM	1.3	0.071	A	A	A		A
5	Lang Road / Gabriels Road All-way stop	AM	12.6	0.555	B	B	B	B	
		PM	10.4	0.292	B	B	C	B	
6	Lang Road / Welgevonden Stop on southern side	AM	5.4	0.314	A	A	A		A
		PM	5.2	0.168	A	A	A		A
7	R304 / Welgevonden Blvd Traffic Signal	AM	18.3	0.886	B	B	D	B	D
		PM	19.3	0.89	B	B	E	A	E

The impact on capacity and intersection operation was analysed using SIDRA Intersection modelling software. The intersections were modelled individually and not as a network. Based on the results of these capacity analyses, the intersections currently operate at acceptable Levels-Of-Service (LOS) during both peak hours except for the R44/Hendrikse Road intersection which operates at an unacceptable LOS during the AM Peak. The impact and mitigation measures of the development traffic at all the intersections will be investigated in the full Transport Impact Assessment.

Based on the assessment of existing traffic conditions, all the study intersections operate at acceptable level-of-service except the Intersection of R44 and Hendrikse Road which currently experiences severe

delays during the morning peak hour. An increase in pedestrian activity is expected, consideration must be given to expanding the provision of sidewalks along Hendrikse Road and Gabriels Road to link with Lang Street which is the main route for public transport within Cloeteville.

5.3.6.3 Traffic Impact Assessment

The National Department of Transport TIA manual prescribed Traffic Impact Statements (TIS) for developments that generate trips between 50 and 150; And Traffic Impact Assessments (TIAs) for developments that generate over 150 peak hour trips. However, Technical Methods of Highways (TMH) 16 no longer makes the distinction between a TIS and TIA. Rather a full TIA is recommended for all developments that generate over 50 peak hour trips. The estimate of traffic that will likely be generated by the proposed development at Erf 7001 is shown below.

Low Vehicle Ownership reduction is applicable. Because of the public transport usage of the community, reduction for Transit Nodes is applicable. The table below summarises the adjusted trips. The reduction in vehicle trips correlates with an increase in NMT and public transport trips; which may necessitate increased provision of facilities. Though nearly halved an increase in trips of this magnitude would have a notable impact on the performance of the key intersections, specifically the R304 and the R44.

Table 9: Development Trip Generation (Adjusted)

Land Use Type	Number (Units)	Trips	AM		PM	
			In	Out	In	Out
Single Residential	204	100	25	75	70	30
Total Trips		100	25	75	70	30

It is assumed that the generated trips will distribute throughout Cloeteville the same as the existing traffic. The nature of the development is simply additional dwelling units in an already established residential neighbourhood. It is envisioned that the socio-economic profile of the new residents will be similar or the same to the rest of Cloeteville. There is therefore no reason to expect that the traffic patterns will be different. The existing traffic counts were used to estimate:

1. The global distribution i.e., the proportion of traffic that will use specific accesses to the neighbourhood;
2. The local distribution i.e., the proportion of traffic assigned to each movement at a particular intersection.

Despite there being 3 signalised access roads in the suburb, it was assumed that 100% of the development traffic will use either the R304 or the R44 as the primary access road for Cloeteville. Based on the existing traffic patterns the following estimations were made about the *Global* traffic distribution shown in **Error! Reference source not found.**

- 77% AM traffic will enter via R304 and 23% traffic will enter via R44,
22% AM traffic will exit via R304 and 78% will exit via R44.
- 33% PM traffic will enter via R304 and 67% traffic will enter via R44,
53% PM traffic will exit via R304 and 47% traffic will exit via R44.

Thereafter it is assumed all traffic will take the most direct path to the erf 7001.

Based on the initial analyses results, all study intersections will continue to operate at the same Levels of Service as with the background traffic scenario. This is evidence that the congestion and LOS issues at the two key intersections at R304 and R44 are systemic and not as a result of the introduction of the development.

From a traffic and transport point of view there is no reason for this infill housing project to not be approved. The additional traffic created by the development is not the cause of the failing intersection at the R44.

It is recommended that the signal phasing at the R304 x Welgevonden intersection be reviewed in light of intersection modelling results demonstrated in this report.

It is recommended that the signal phasing at the R44 x Hendrickse intersections be reviewed be reviewed in light of intersection modelling results and lane configuration changes proposed in this report.

It is recommended that the Arterial Management plan for the R44 be reviewed in the light of the proposed signalisation of the Fir Road and R44 intersection.

5.3.6.4 Motivation for the inclusion of 8m Road Reserves in the Development Layout:

Streets often constitute a significant portion of developable land, sometimes accounting for up to 35% of the total land use of a development. They are frequently treated as utilitarian corridors in our urban landscape, almost always designed with the vehicle in mind. In developments with a residential nature, such as the Cloetesville, we suggest reducing the minimum road width from 10m to 8m to create a series of shared 'living' streets. The preferred development concept will accommodate a range of one and two storey single residential or semi-detached / rowhousing units with front doors on street edge.

A 'shared street' is a residential street designed to eliminate the separations between walking, cycling, and vehicular movement, enhancing the street's liveability. While cars are permitted, they are considered "guests" and yield to other modes and activities. The shared surface design, typically a single surface with no level changes, disrupts the traditional hierarchy of mobility, naturally slowing down car movement, and allowing for a more efficient use of space. This type of street is also referred to as a "woonerf".

In the South African context, creating safe, multifunctional spaces for children's recreation and play is crucial in housing layouts. By removing traditional distinctions between pedestrians and vehicles, the design encourages heightened awareness of surroundings, promoting physical safety. The concept of "eyes on the street", underscores the importance of natural surveillance. A liveable street design fosters increased safety by encouraging more people to be present and active, fostering a sense of community ownership and responsibility. This social connectivity can further contribute to safety, as people are more likely to look out for one another and report any suspicious activities.

Cloetesville is a small residential development that requires careful design to maximize the number of residential opportunities. Incorporating a narrower 8m wide street associated with internal residential pockets creates a unique opportunity for community clusters within the overall development. A higher-order system of 13m wide streets provides both vehicle and pedestrian access to all areas of the site, while the narrower 8m wide streets provide access to internal residential clusters. Despite being lower-order streets, and narrower than the minimum Stellenbosch Municipal standard, these 8m wide streets still make provision for service vehicles.

The inclusion of shared streets not only transforms the physical landscape but also encourages a shift in community dynamics. By reimagining streets as vibrant, shared spaces, we pave the way for safer, more inclusive environments. The integration of the 'eyes on the street' philosophy and the encouragement of active community participation not only enhances security but also fosters a sense of belonging.

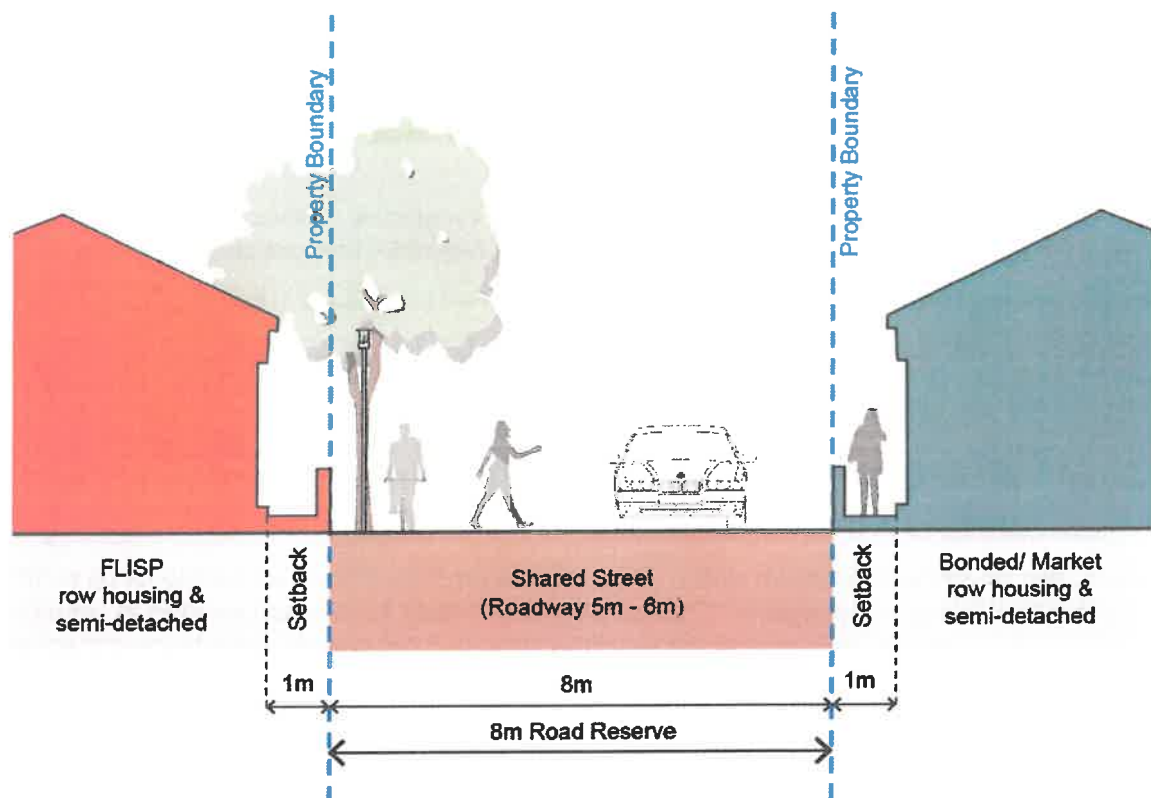


Figure 68 - Examples of shared streets

The preferred development concept will accommodate a range of one and two storey single residential or semi-detached / rowhousing units with front doors on street edge, and in order for this urban design feature to be realised, the 8m road reserves are required to create a sense of community ownership and responsibility in the proposed development.

6 PUBLIC PARTICIPATION

The public participation process followed for the application is in accordance with Section 41(7) of the Stellenbosch Municipal Land Use Planning Bylaw (2015).

The prescribed period which must be allowed for the submission of inputs and comments on an application is 30 days for interested and affected parties, and 60 days for any organ of state.

7 CONCLUSION

There is an urgent need for the property to be developed so as to create an integrated residential environment, providing for a range of housing opportunities and choice by catering inter alia for the mix types of housing. Therefore, the particular goal of this housing development is the delivery of medium to upper (GAP) housing units.

Application is therefore made in terms of Section 15(2) for the **rezoning** of the area known as Erf 7001 and to simultaneously apply in terms of the Stellenbosch Municipality Land Use Management By-laws, 2015 for the **permanent departure** from the development parameters of the zoning scheme; to **subdivide** the erf into various land portions as depicted on the attached subdivision layout plan; for the **closure of a part of a public space** and for a **consent use** to erect a telecommunications mast on the portion to be zoned as Public Open Space Zone.

The report provides a motivation for the proposed development of Erf 7001 Stellenbosch for a proposed housing development. The proposal is made in accordance with the provisions of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2015 as well as the Stellenbosch Municipality: Zoning Scheme By-Law, 2019. Based on the evidence presented and the need for additional housing opportunities in the area, it can be argued that the proposed development will provide a much-needed service to the local residents of Stellenbosch.

The proposal is consistent with existing Policy and Planning Frameworks and adheres to the principles of the Spatial Planning and Land Use Management Act, 2015 (Act No 16 of 2013) (SPLUMA).

The development proposal is also aligned with strategic local and provincial plans.

In view of the above, it is recommended that the Stellenbosch Municipal Council look favourably upon this application.

We thank you for your consideration of the proposed application and look forward to your response.

By my signature below I certify the correctness of the information above.

Rudolf Schröder Pr. Pln A/151/2009

Professional Planner

RSchröder

30 November 2023

Signature

Date

Annexures

ANNEXURE	DESCRIPTION
A	Application Form, completed and signed by Applicant
B	Power of Attorney (Zutari's Appointment Letter & SLA)
C	Proof of Registered Ownership (Title Deed)
D	Copy of the Surveyor-General's Diagram
E	Locality Plan
F	Subdivisional Layout Plan / Site Development Plan
G	Zoning Certificate
H	SACPLAN Registration Certificate
I	SG Status Report
J	Contour Cadastral Basemap
K	Telecommunication Mast Infrastructure Drawings
L	Environmental Authorisation
M	Geotechnical Report
N	Services Investigation Report (Civil)
O	Traffic Impact Assessment Report
P	Electrical Services Report

In diversity there is beauty
and there is strength.

MAYA ANGELOU

Document prepared by:

Zutari (Pty) Ltd

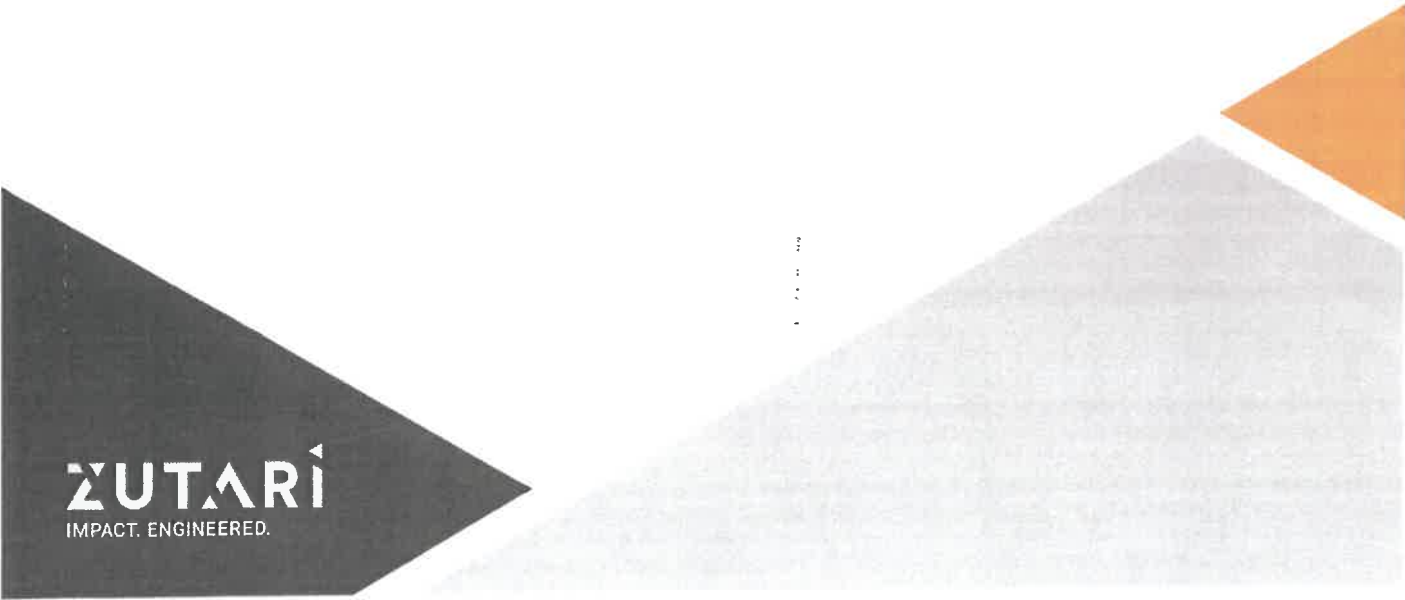
Reg No 1977/003711/07

264 Main Street

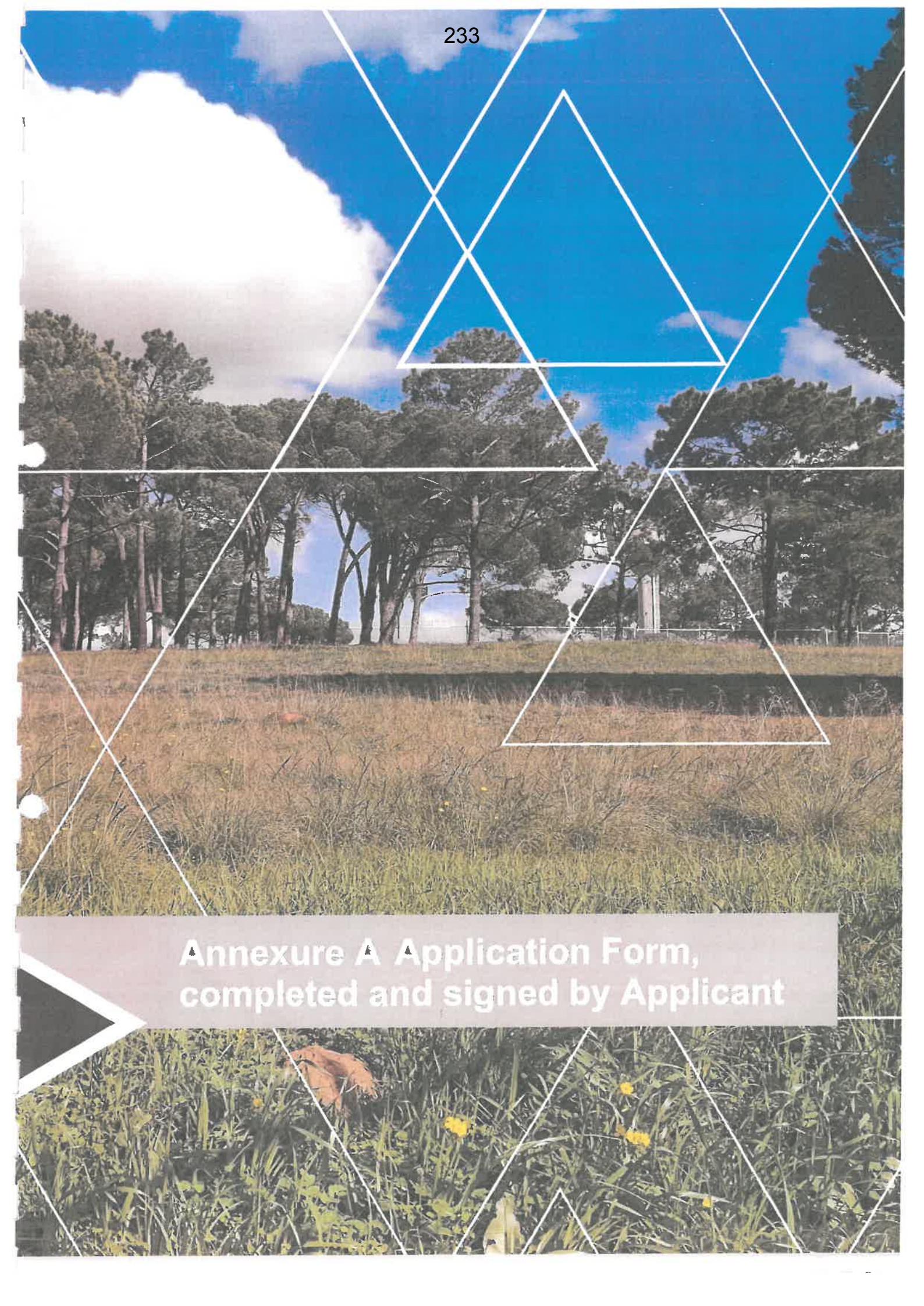
Paarl

South Africa

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E paarl@zutari.com



ZUTARÍ
IMPACT. ENGINEERED.



**Annexure A Application Form,
completed and signed by Applicant**



STELLENBOSCH

STELLENBOSCH • PNIEL • FRANSCHHOEK

MUNICIPALITEIT • UMASIPALA • MUNICIPALITY

DIRECTORATE: PLANNING & ECONOMIC DEVELOPMENT

www.stellenbosch.gov.za/planning-portal/

SUBMIT COMPLETED FORM TO landuse.applications@stellenbosch.gov.za

LAND USE PLANNING APPLICATION FORM

(Section 15 of the Stellenbosch Municipal Land Use Planning By-Law (2015) and other relevant legislation)

KINDLY NOTE: Please complete this form using BLOCK letters and ticking the appropriate boxes.

PART A: APPLICANT DETAILS

First name(s)	Rudolf				
Surname	Schröder				
Company name (if applicable)	Zutari				
Postal Address	65 York Street				
	George	Postal Code	6529		
Email	rudolf.schroder@zutari.com				
Tel	0448055400	Fax		Cell	0833906963

PART B: REGISTERED OWNER(S) DETAILS (If different from applicant)

Registered owner(s)	Stellenbosch Municipality				
Physical address	NPK Building, corner of Rynveld and Van Riebeeck Streets, 2nd Floor				
	Stellenbosch	Postal code	7600		
E-mail	Shaun.October@stellenbosch.gov.za				
Tel	+27 21 808 8756	Fax		Cell	0827889891

PART C: PROPERTY DETAILS (in accordance with title deed)

Erf / Erven / Farm No.	7001	Portion(s) if Farm		Allotment area	Stellenbosch		
Physical Address	Hendrickse Street, Cloeteville, Stellenbosch						
Current Zoning	Public Open Space	Extent	6.5341	m ² / ha	Are there existing buildings?	Y	N ☒
Applicable Zoning Scheme	Stellenbosch Municipality: Zoning Scheme By-Law, 2019						

Current Land Use	Vacant & municipal infrastructure									
Title Deed number and date	T	56720/1987								
Attached Conveyance's Certificate	Y	☒	Any Restrictions to the Attached Conveyance's Certificate? If yes, please list condition(s) as per certificate							
Are the restrictive conditions in favour of a third party(ies)?	Y	☒	If Yes, list the party(ies):							
Is the property encumbered by a bond?	Y	☒	If Yes, list the bondholder(s):							
Is the property owned by Council?	☒	N	If Yes, kindly <u>attach a power of attorney</u> from the Manager Property Management							
Is the building located within the historical core?	Y	☒	Is the building older than 60 years?	Y	☒	Is the application triggered by the National Heritage Resources Act, 1999 (Act 25 of 1999)?	Y	☒	If Yes, kindly indicate which section are triggered and attached the relevant permit if applicable.	
Any existing unauthorized buildings and/or land use on the subject property(ies)?			Y	☒	If yes, is this application to legalize the building / land use?			Y	☒	
Are there any pending court case(s) / order(s) relating to the subject property(ies)?			Y	☒	Are there any land claim(s) registered on the subject property(ies)?			Y	☒	

PART D: PRE-APPLICATION CONSULTATION AND OR SCRUTINY

Has there been any pre-application consultation?	☒	If Yes, please attach the minutes of the pre-application consultation.
Has the pre-application scrutiny form been submitted?	☒	If yes, please attach the written feedback received.

* The submission of a pre-application scrutiny form is compulsory for this type of application as listed below and written feedback must be attached to the land use planning application.

PART E: LAND USE PLANNING APPLICATIONS AND APPLICATION FEES PAYABLE**APPLICATIONS IN TERMS OF SECTION 15 OF THE STELLENBOSCH MUNICIPAL LAND USE PLANNING BY-LAW (2015)**

Type of application: Cost are obtainable from the Council Approved tariffs	Tick
15(2)(a) rezoning of land*	☒
15(2)(b) a permanent departure from the development parameters of the zoning scheme	☒
15(2)(c) a departure granted on a temporary basis to utilise land for a purpose not permitted in terms of the primary rights of the zoning applicable to the land	
15(2)(d) a subdivision of land that is not exempted in terms of section 24, including the registration of a servitude or lease agreement*	☒
15(2)(e) a consolidation of land that is not exempted in terms of section 24*	
15(2)(f) a removal, suspension or amendment of restrictive conditions in respect of a land unit*	

¹ All applications triggered by section 38(1)(a) - (e) in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999) may not be processed without a permit issued by the relevant department

² No application may be submitted to legalize unauthorised building work and or land use on the property if a notice has been served in terms of Section 87(2)(a), and until such time a Section 91 Compliance Certificate have been issued in terms of the Stellenbosch Land Use Planning By-law (2015)

15(2)(g) a permission required in terms of the zoning scheme	
15(2)(h) an amendment, deletion or imposition of conditions in respect of an existing approval*	
15(2)(i) an extension of the validity period of an approval	
15(2)(j) an approval of an overlay zone as contemplated in the zoning scheme	
15(2)(k) an amendment or cancellation of an approved subdivision plan or part thereof, including a general plan or diagram*	
15(2)(l) a permission required in terms of a condition of approval	
15(2)(m) a determination of a zoning*	✓
15(2)(n) a closure of a public place or part thereof	✓
15(2)(o) a consent use contemplated in the zoning scheme	
15(2)(p) an occasional use of land	
15(2)(q) to disestablish a home owner's association	
15(2)(r) to rectify a failure by a home owner's association to meet its obligations in respect of the control over or maintenance of services	
15(2)(s) a permission required for the reconstruction of an existing building that constitutes a non-conforming use that is destroyed or damaged to the extent that it is necessary to demolish a substantial part of the building	
15(2)(6) when the Municipality on its own initiative intends to conduct land development or an activity	
15(2)(l) amendment of Site Development Plan	
15(2)(l) Compilation / Establishment of a Home Owners Association Constitution / Design Guidelines	

OTHER APPLICATIONS

Deviation from Council Policies/By-laws	R
Consent / Permission required in terms of a title deed	R
Technical approval in terms of the Zoning Scheme Bylaw, 2019	R
Other (specify): _____	R
TOTAL A:	R

PRESCRIBED NOTICE AND FEES* (for completion and use by official)**

Tick	Notification of application in media	Type of application	Cost
	SERVING OF NOTICES	Delivering by hand; registered post; electronic communication methods	R
	PUBLICATION OF NOTICES	Local Newspaper(s); Provincial Gazette; site notice; Municipality's website	R
	ADDITIONAL PUBLICATION OF NOTICES	Site notice, public meeting, local radio station, Municipality's website, letters of consent or objection	R
	NOTICE OF DECISION	Provincial Gazette	R
	INTEGRATED PROCEDURES	T.B.C	R
TOTAL B:			R
NO FEES PAYABLE			R
TOTAL APPLICATION FEES** (TOTAL A + B)			R

****The complete application should first be submitted without the payment of any applicable application fees. Only when satisfied that a complete and accurate application has been submitted, will a proforma invoice be submitted to the applicant with payment instructions. Application fees that are paid to the Municipality are non-refundable and once proof of payment is received, the application will be regarded as duly submitted.**

*****All indigent residents who are registered as such with the Municipality and with proof submitted together with application will be exempted from applicable fees for Permanent Departure applications including but not limited to building lines, coverage, height, bulk, parking. Contact: indigent.office@ Stellenbosch.gov.za or 021 808 8501 or 021 808 8579**

****** The applicant is liable for the cost of publishing and serving notice of an application. Additional fees may become applicable and the applicant will be informed accordingly.**

BANKING DETAILS

Account Holder Name: Stellenbosch Municipality
 Bank: FIRST NATIONAL BANK (FNB)
 Branch no.: 210554
 Account no.: 62869253684
 Payment reference: LU/_____ and ERF/FARM _____

Please use both the Land Use Application number and the Erf/Farm number indicated on the invoice as a reference when making EFT payment

DETAILS FOR INVOICE

Name & Surname/Company name (details of party responsible for payment)	N/A
Postal Address	
Vat Number (where applicable)	

PART F: DETAILS OF PROPOSAL

Building line encroachment	Street		From	m 2	To	m 1
	Street		From	m 3	To	m 1
	Side		From	m	To	m
	Side		From	m	To	m
	Aggregate side		From	m	To	m
	Rear		From	m	To	m
Exceeding permissible site coverage			From	%	To	%
Exceeding maximum permitted bulk / floor factor / no of habitable rooms			From		To	
Exceeding height restriction			From	m	To	m
Exceeding maximum storey height			From	m	To	m
Consent/Conditional Use/Special Development						
To permit the erection of a telecommunications mast on the portion to be zoned as Public Open Space Zone (proposed Erf 205), in terms of Section..15(2)(9).....of the.....the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2015.....Zoning Scheme Regulations						
Other (please specify)	Application made for a reduction in the standard parking requirement: 1 pay per dwelling house					

Brief description of proposed development / intent of application:

Rezoning and subdivision of the land parcel known as Erf 7001 Cloeteville, Stellenbosch in order to create additional housing opportunities to the medium to upper (GAP) target market.

See details and motivation in the attached Report and annexures.

PART G: ATTACHMENTS AND SUPPORTING INFORMATION AND DOCUMENTATION FOR LAND USE PLANNING APPLICATION

Complete the following checklist and attach all the information and documentation relevant to the proposal. Failure to submit all information and documentation required will result in the application being deemed incomplete.

Information and documentation required

☒	N	Power of attorney / Owner's consent if applicant is not owner		Y	N	Bondholder's consent (if applicable)
Y	N	Resolution or other proof that applicant is authorised to act on behalf of a juristic person		Y	N	Proof of any other relevant right held in the land concerned
☒	N	Written motivation pertaining to the need and desirability of the proposal		☒	N	S.G. diagram / General plan extract (A4 or A3 only)
☒	N	Locality plan (A4 or A3 only) to scale		☒	N	Site development plan or conceptual layout plan (A4 or A3 only) to scale
☒	N	Proposed subdivision plan (A4 or A3 only) to scale		Y	N	Proof of agreement or permission for required servitude
Y	☒	Proof of payment of application fees		☒	N	Proof of registered ownership (Full copy of the title deed)
Y	☒	Conveyancer's certificate		Y	☒	Written feedback of pre-application scrutiny and Minutes of pre-application consultation meeting (if applicable)
Y	N	☒ Consolidation plan (A4 or A3 only) to scale		☒	N	N/A Land use plan / Zoning plan (A4 or A3 only) to scale
Y	☒	N/A Street name and numbering plan (A4 or A3 only) to scale				
Y	N	☒ Landscaping / Tree plan (A4 or A3 only) to scale		Y	N	☒ 1 : 50 / 1:100 Flood line determination (plan / report) (A4 or A3 only) to scale
Y	N	☒ Abutting owner's consent		Y	N	☒ Home Owners' Association consent
☒	N	N/A Copy of Environmental Impact Assessment (EIA) / Heritage Impact Assessment (HIA) / <u>Traffic Impact Assessment (TIA)</u> / Traffic Impact Statement (TIS) / Major Hazard Impact Assessment (MHIA) / <u>Environmental Authorisation (EA)</u> / Record of Decision (ROD)		☒	N	N/A Services Report or indication of all municipal services / registered servitudes
Y	N	☒ Copy of original approval and conditions of approval		Y	N	☒ Proof of failure of Home owner's association

Y	N	N/A	Proof of lawful use right		X	N	N/A	Any additional documents or information required as listed in the pre-application consultation form / minutes
X	N	N/A	Required number of documentation copies		Y	N	N/A	Other (specify)

PART H: AUTHORISATION(S) SUBJECT TO OR BEING CONSIDERED IN TERMS OF OTHER LEGISLATION

X	N	If required, has application for EIA / HIA / TIA / TIS / MHIA approval been made? If yes, attach documents / plans / proof of submission etc.	Specific Environmental Management Act(s) (SEMA) (e.g. Environmental Conservation Act, 1989 (Act 73 of 1989))
Y	N/A	Subdivision of Agricultural Land Act, 1970 (Act 70 of 1970)	Y N/A National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)
Y	N/A	Spatial Planning and Land Use Management Act, 2013 (Act 16 of 2013) (SPLUMA)	Y N/A National Environmental Management: Waste Act, 2008 (Act 59 of 2008)
Y	N/A	Occupational Health and Safety Act, 1993 (Act 85 of 1993): Major Hazard Installations Regulations	Y N/A National Water Act, 1998 (Act 36 of 1998)
Y	N/A	Land Use Planning Act, 2014 (Act 3 of 2014) (LUPA)	Y N/A Other (specify)
Y	X	Do you want to follow an integrated application procedure in terms of section 44(1) of the Stellenbosch Municipality Land Use Planning By-Law? If yes, please attach motivation.	

SECTION I: DECLARATION

I hereby wish to confirm the following :

1. That the information contained in this application form and accompanying documentation is complete and correct.
2. I'm aware that it is an offense in terms of section 86(1)(e) to supply particulars, information or answers knowing the particulars, information or answers to be false, incorrect or misleading or not believing them to be correct.
3. I am properly authorized to make this application on behalf of the owner and that a copy of the relevant power of attorney or consent is attached hereto.
4. Where an agent is appointed to submit this application on the owner's behalf, it is accepted that correspondence from and notifications by the Municipality in terms of the by-law will be sent only to the agent and that the owner will regularly consult with the agent in this regard.
5. I confirm that the relevant title deed(s) have been read and that there are no restrictive title deed restrictions, which impact on this application, or alternatively an application for removal/suspension or amendment forms part of this submission.
6. I confirm that I have made known all information relating to possible Land / Restitution Claims against the application property.
7. It is the owner's responsibility to ensure that approval is not sought for a building or land use which will be in conflict with any applicable law.
8. The Municipality assesses an application on the information submitted and declarations made by the owner or on his behalf on the basis that it accepts the information so submitted and declarations so made to be correct, true and accurate.

9. Approval granted by the Municipality on information or declarations that are incorrect, false or misleading may be liable to be declared invalid and set aside which may render any building or development pursuant thereto illegal.
10. The Municipality will not be liable to the owner for any economic loss suffered in consequence of approval granted on incorrect, false or misleading information or declarations being set aside.
11. Information and declarations include any information submitted or declarations made on behalf of the owner by a Competent Person/professional person including such information submitted or declarations made as to his or her qualification as a Competent person and/or registration as a professional.
12. A person who provides any information or certificate required in terms of Regulation A19 of the National Building Regulations and Building Standards Act No 103 of 1977 which he or she knows to be incomplete or false shall be guilty of an offence and shall be prosecuted accordingly.
13. A person who supplies particulars, information or answers in a land use application in terms of the Stellenbosch Municipality Land Use Planning By-law knowing it to be incorrect, false or misleading or not believing them to be correct shall be guilty of an offence and shall be prosecuted accordingly.
14. The Municipality will refer a complaint to the professional council or similar body with whom a Competent Person/professional person is registered in the event that it has reason to believe that information submitted or declaration/s made by such Competent Person/professional person is incorrect, false or misleading.
15. I am aware that by lodging an application, the information in the application and obtained during the process may be made available to the public.

Applicant's signature:

CR Schröder

Date:

30 November 2023

Full name:

Cornelis Rudolf Schröder

Professional capacity:

Professional Planner (SACPLAN A/151/2009)**FOR OFFICE USE ONLY**

Date received: _____

Received By: _____



**Annexure B Power of Attorney
(Zutari's Appointment Letter & SLA)**



STELLENBOSCH
STELLENBOSCH • PNIEL • FRANSCHHOEK
MUNISIPALITEIT • UMSTADALA • MUNICIPALITY

Your ref:

Our ref: 17/4/4/7/20

28 April 2022

Zutari (Pty) Ltd
264 Main Rd
PAARL
7646

Email: Buks.Zeeman@zutari.com

ATTENTION: Mr Zeeman

Dear Sir

LETTER OF APPOINTMENT: tender BSM 118/21: TO APPOINT A PROFESSIONAL SERVICE PROVIDER TO ASSEMBLE A MULTI-DISCIPLINARY TEAM OF PROFESSIONALS IN TO UNDERTAKE A BROAD CONCEPTUAL URBAN DESIGN FRAMEWORK ON ERF 7001, CLOETESVILLE, STELLENBOSCH, AND TO OBTAIN TOWN PLANNING AND DEVELOPMENT RIGHTS.

It is our pleasure to inform you that Zutari (Pty) Ltd has been appointed as Project Manager to assemble a multi-disciplinary team of professionals to undertake a Broad Conceptual Urban Design framework on Erf no. 7001, Cloeteville, Stellenbosch, and to obtain town planning and development rights. The total amount for the work to be carried out by the lead consultant together with the professionals' teams is R2 016 515.74 (15% VAT inclusive).

The appointment is in accordance with the specifications as set out in the scope of work. If there is any uncertainty regarding the scope of work, it should be addressed as soon as possible.

This document consists of the following sections:

1. BACKGROUND
2. PROJECT RELOCATION
3. SCOPE AND OBJECTIVES
4. CONCEPTUAL FRAMEWORK
5. KEY PERSONNEL
6. PROGRAMME AND TIME FRAME
7. PERFORMANCE
8. PROFESSIONAL IMDEMNITY INSURANCE
9. REMUNERATION
10. CASHFLOW
11. BREACH
12. DISPUTES



STELLENBOSCH
STELLENBOSCH • PNIEL • FRANSCHHOEK

MUNICIPALITY • UMASIPALA • MUNISIPALITEIT

SERVICE LEVEL AGREEMENT

For the

APPOINTMENT OF A PROFESSIONAL SERVICE PROVIDER TO ASSEMBLE A MULTI-DISCIPLINARY TEAM OF PROFESSIONALS TO UNDERTAKE A BROAD CONCEPTUAL URBAN DESIGN FRAMEWORK ON ERF NO. 7001, CLOETESVILLE, STELLENBOSCH, AND TO OBTAIN TOWN PLANNING AND DEVELOPMENT RIGHTS.

Between

STELLENBOSCH LOCAL AUTHORITY

A Local Authority established in terms of section 12 of Act 117 of 1998 and duly represented by
Ms. Geraldine Mettler in her capacity as Municipal Manager

(Hereinafter referred to as "**the Local Authority**")

And

ZUTARI (PTY) LTD

Duly represented by **Mr. Albertus Petrus Zeeman** in his capacity as Duly Authorized Signatory

(Hereinafter referred to as "**the Consultant**")

(Individually referred to as "**the Party**" and collectively as "**The Parties**")



Annexure C Title Deed

PROD DEEDS REGISTRATION SYSTEM - CAPE TOWN
 PREPARED BY : DRS08131 - ERASMUS N

DATE : 20170719 TIME : 11:24:28.1 PAGE : 1

PROPERTY DETAILS PRINT FOR PORTION 0 (R/E)
 ERF NO 7001
 TOWNSHIP STELLENBOSCH
 REG DIV STELLENBOSCH RD

PROVINCE WESTERN CAPE
 PREV DESCRIPTION PTN OF 7271-TP9460
 DIAGRAM DEED NO T56720/1987
 EXTENT 6.5341 H
 CLEARANCE STELLENBOSCH MUN

FIRM NR : 999
 FIRM NAME : AKTEKANTOOR KAAPSTAD
 FILE NR : PREP
 FEE AMOUNT: R .00

NO INTERDICTS

DOCUMENTS
 PUBLIC-PLACE

HOLDER

AMOUNT O/P/A SCAN/MICRO REF MDD

OWNER DETAILS

FULL NAME & SHARE	PURCH DATE	AMOUNT/REASON	O/P/A	IDENTITY	DATE OF BIRTH	TITLE DEED	MDD	SCAN/MICRO REF
MUN STELLENBOSCH						T56720/1987	1123	1987 1399 1614

ORT

* O/P/A - O - MULTIPLE OWNER P - MULTIPLE PROPERTY A - MULTIPLE OWNER AND PROPERTY

** PLEASE NOTE : THE INFORMATION APPEARING ON THIS PRINTOUT IS FURNISHED FOR PURPOSES OF INFORMATION ONLY.
 FOR MORE DETAILED INFORMATION, PLEASE REFER TO THE REGISTERED SOURCE DOCUMENTS.

*** END OF REPORT ***

CLUVER & MARKOTTER
117

FOR FURTHER ENDS SPRAAKTEES
VIR VERDERE ENDSIN IN DIE TITEL ... blad 3

ISSUED FOR INFORMATION ONLY
ALLEEN VIR INFORMATIE DOEL ENDE UITGEREIK

T 56720.87

Opgestel deur my

AKTEBESORGER

J W BASSON

SERTIFIKAAT VAN GEREGISTREERDE TITEL

(Uitgereik kragtens die bepallings van Artikel Drie-en-Veertig van die
Registrasie van Aktes Wet, 1937, (Nr 47 van 1937))

NADEMAAL

DIE MUNISIPALITEIT STELLENBOSCH

aansoek gedoen het om die uitreiking aan hom van 'n Sertifikaat van
Geregistreeerde Titel kragtens Artikel Drie-en-Veertig van die Registra-
sie van Aktes Wet, 1937, ten opsigte van hierondergenoemde grond, synde
gedeelte van die grond geregistreer op sy naam deur Sertifikaat van Ver-
enigde Titel Nr T21038/1976.

- 2 -

GFB

SO IS DIT DAT Ingevolge die bepallings van genoemde Wet, ek die Registrateur van Aktes te Kaapstad hierby sertifiseer dat voornoemde

MUNISIPALITEIT STELLENBOSCH

hul Regverkrygendes,

die geregistreerde elenaar is van

ERF 7001 STELLENBOSCH (PUBLIEKE PLEK) in die Munisipaliteit en Afdeling STELLENBOSCH

GROOT 6,6341 (SES KOMMA SES RIE VIER EEN) hektaar

SOOS AANGEDUI op aangehegte Diagram LG Nr 3122/87 en gehou kragtens Sertifikaat van Verenigde Titel No T21038/76

ONDERHEWIG aan die voorwaardes waarna verwys word in Transportakte Nr 12966 gedateer 27 Julie 1951, maar SOOS UITEENGESIT in Transportakte Nr 12966 gedateer 27 Julie 1951, nie geregtig op die voordeel van of onderhewig aan die waterregte vermeld en waarna verwys word in die voorwaarde Nr 5(1)(2) in Akte van Verdelingstransport Nr T1074 gedateer 1 Februarie 1946, welke waterregte deur die Komparant se Prinsipaal daar- onder (naamlik HERMANUS JACOBUS POTGIETER - Gebore 1 Januarie 1905) as elenaar van die Restant van die eiendom gehou deur Akte van Verdelings- transport Nr 1074 gedateer 1 Februarie 1946, voorbehou word.

EN DAT, kragtens hierdie Sertifikaat, genoemde Munisipaliteit Stellenbosch, of hul Regverkrygendes, nou en voortaan daartoe geregtig is ooreenkomstig plaaslike gebruik, maar behoudens die Regte van die Staat.

TEN BEWYSE waarvan ek, voornoemde Registrateur, hierdie Akte onderteken en met die Ampseël bekragtig het.

GEKLEURDE
GROEP
COLOURED GROUP

ISSUED FOR INFORMATION ONLY
ALLEEN VIR INFORMATIE SLEK

- 3 -

JB

ALDUS GEDOEN en GETEKEN op die Kantoor van die REGISTRATEUR
VAN AKTES te KAAPSTAD op hede die 23 dag van November
In die jaar van Onse Heer, EENDUISEND NEGEHONDERD SEWE EN
TAGTIG (1987)


REGISTRATEUR VAN AKTES

Geregistreer in die

Register

Boek

Folio

KLERK IN BEVEL

Certified a true copy of the original filed
of record in this Registry in terms of

Reg 66

Deeds Registry
Cape Town

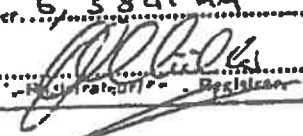
20/07/2017



Registrar of Deeds

3

E 4 8963 = 500 m²

GETRANSPOORTEER TRANSFERRED	11-23	aan K.A. FORD
No. T. 50721-87	1987	Resant Reinsider. 6, 5841 HA
 Registrateur Registrat.		

E 4 8964 = 500 m²

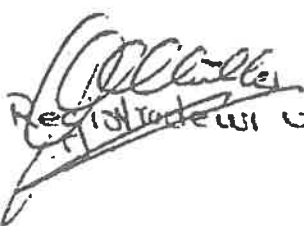
GETRANSPOORTEER TRANSFERRED	11-23	aan S. STRYDOM
No. T. 50722-87	1987	Resant Reinsider. 6, 5341 HA
 Registrateur Registrat.		

ISSUED FOR INFORMATION ONLY
ALLEN BY KONTASWEDDELING VERREIK

Kragtens Landmeter-Generaal se toestemming
gedateer 1-9-1987 word gedeelte van
Opendare Plek gemerk Bxyz op k.g. no
3122/87 hiermee nou gesluit

ekskantoor,
Kaapstad.

1987-11-23


 Registrateur van Aktes.



Annexure D SG Diagrams

TP 2460

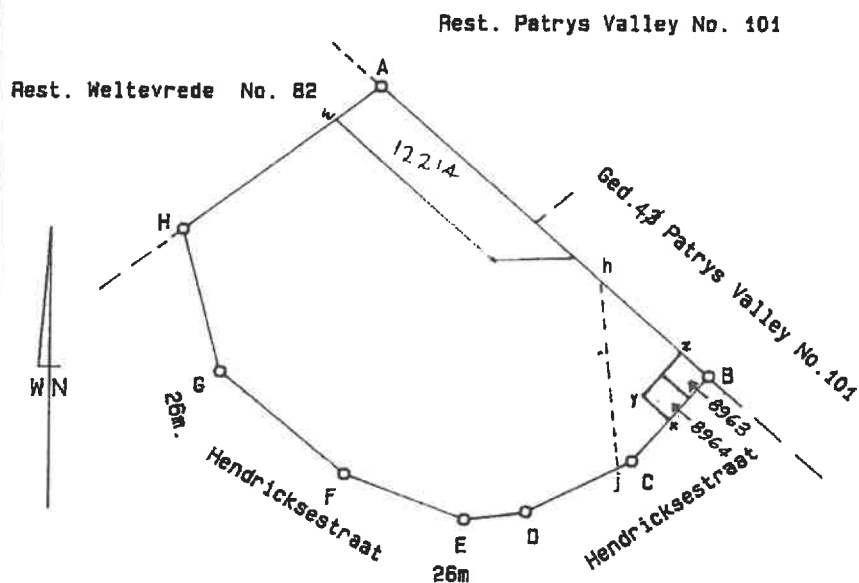
KANTOORAFSKRIF

Friedlaender Burger & Volkmann, Land Surveyors

SYE Meter	RISTINGS- HOEKE	L.G. No.
A B	311,50	311 19 20
B C	80,76	41 19 10
C D	83,27	64 06 30
D E	43,75	82 36 50
E F	91,71	110 33 20
F G	114,15	129 32 00
G H	104,66	165 00 00
H A	172,36	233 34 00
		Goedgekeur
		<i>A. Burger</i>
		Landmeter-generaal
		87/09/87

Beskrywing van Bakens.

A ----- 25mm pen teenaan spoorstaaf paal in ou baksteen baken
 Alle ander bakens is 12mm. penne



Skaal 1: 4000

Die figuur A B C D E F G H

stel voor 6,6341 hektaar

ERF 7001 STELLENBOSCH (PUBLIEKE PLEK)

grond, synde

geleë in Cloeteville Dorp Uitbreiding No. 2

in die Munisipaliteit en

Administratiewe Distrik van Stellenbosch

Provinsie Kooip die Goeie Hoop.

Vervaardig kragtens Artikke 39 van Akte 9 van 1927 in April 1987

deur my

A. Burger
 Landmeter

Hierdie kaart is geheg aan

T/A
 No. 56720/87
 gedateer
 t.g.v.

Registrateur van Aktes

Lêer No. Stel. 81
 M.S. No. Vervaardig.
 Komp. BHSZ-121 (6930)

Alg. Plan TP No. 9460
 Vel No. 3 en 5

SIEK 1:1000 VAN KAART

7001

		MEET SOURCE	PANALIST	FEE	DATE
E997167	51820/87	5-1	ENK	500	56721/87
5997167	51321/87	L-1	EP	500	56722/87
E 2828195	9180/95	-	1221 F		

28/05/27

[illegible]

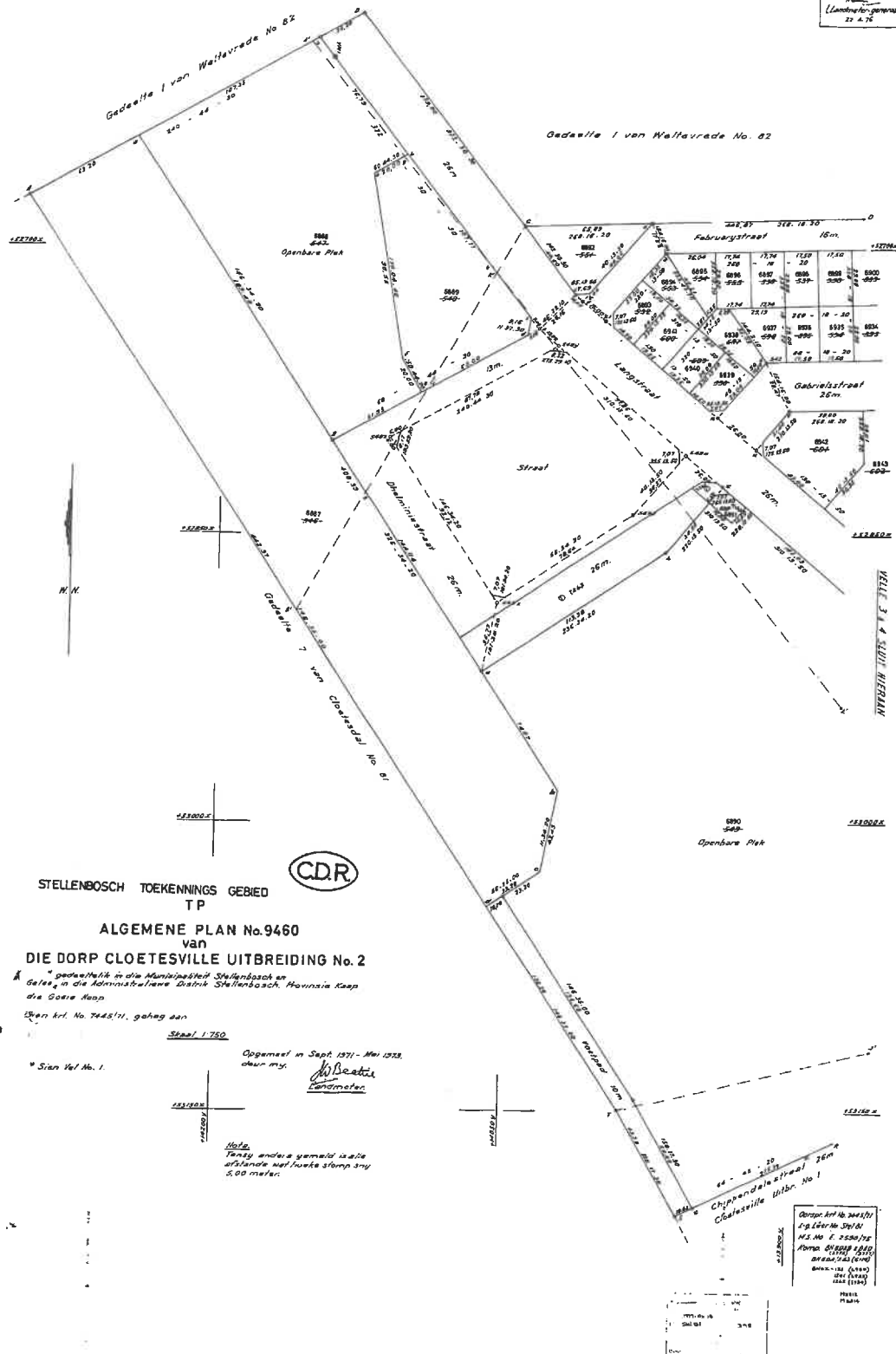
FUGLE
 1908 gennedningsregiments Afdeling 667, 722/4
 godset. Glen Sandskolek og kongeligving
 1908 1909-09-03
 Læs Sten 81 bladet.
 1933 09-17
 1908 LANDMETTERGENERAAL
 1908 1909-09-03

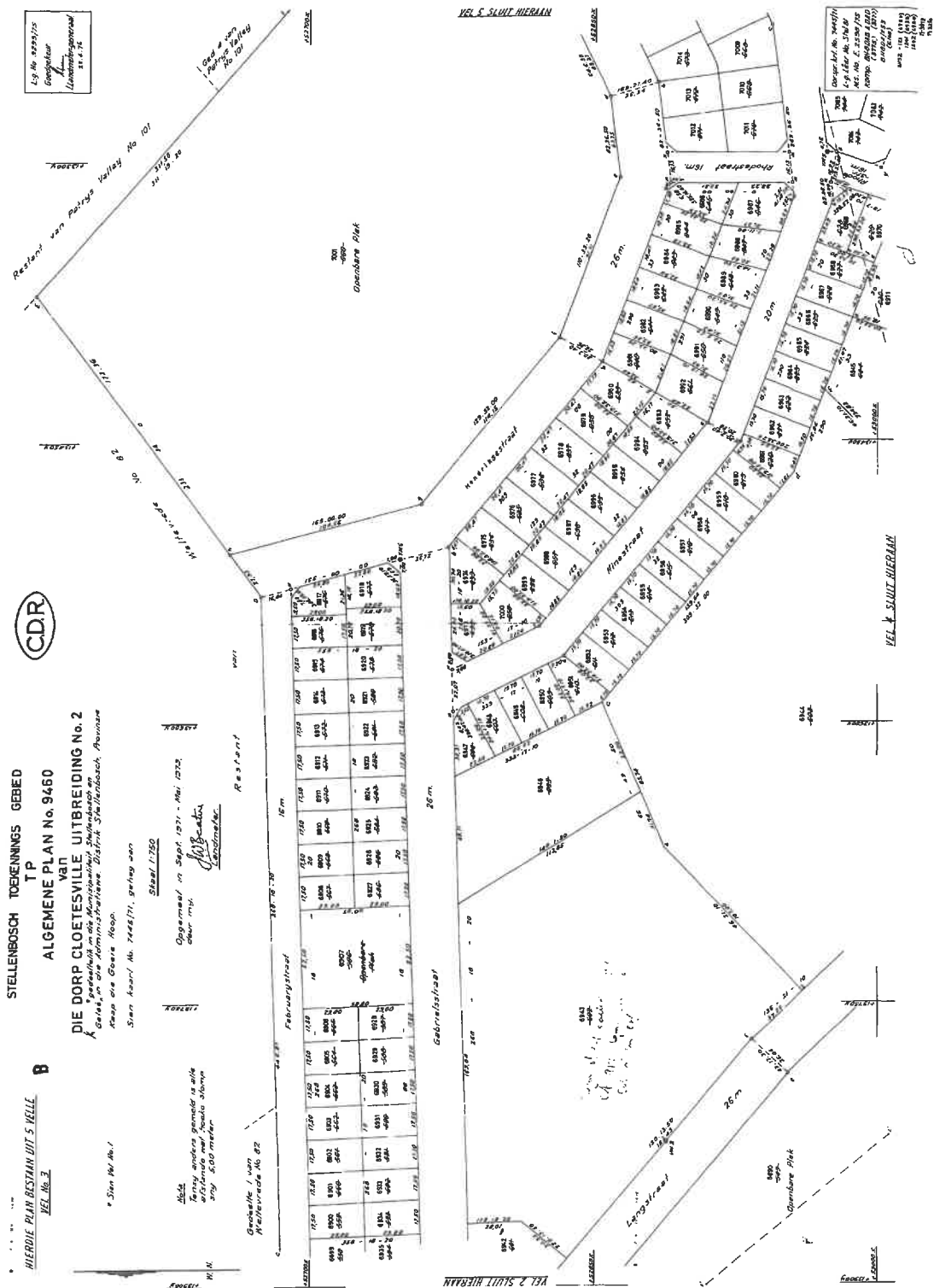
9460

VEL 2

HIERDIE PLAN BESTAAN UIT 5 VELLE
VEL No. 2

Lg. No. 2523/75
Gedagteur
Landreghes-gegras
20 4.75







(C.D.R.)

STELLENBOSCH TOEKENNINGS GEBIED

C.D.R.

L.g. No 9233/75
Goedgekeur.
Akan.
Landmeter-generaal
23. 4. 76

ALGEMENE PLAN No. 9460

van
DIE DORP CLOETESVILLE UITBREIDING №2

Gadenite & van
Petrys Valley
No 101

gedeelte in die Munisipaliteit Stellenbosch en
Gedeelte in die Administratiewe Distrik Stellenbosch,
Provinsie Kaap die Goede Hoop.

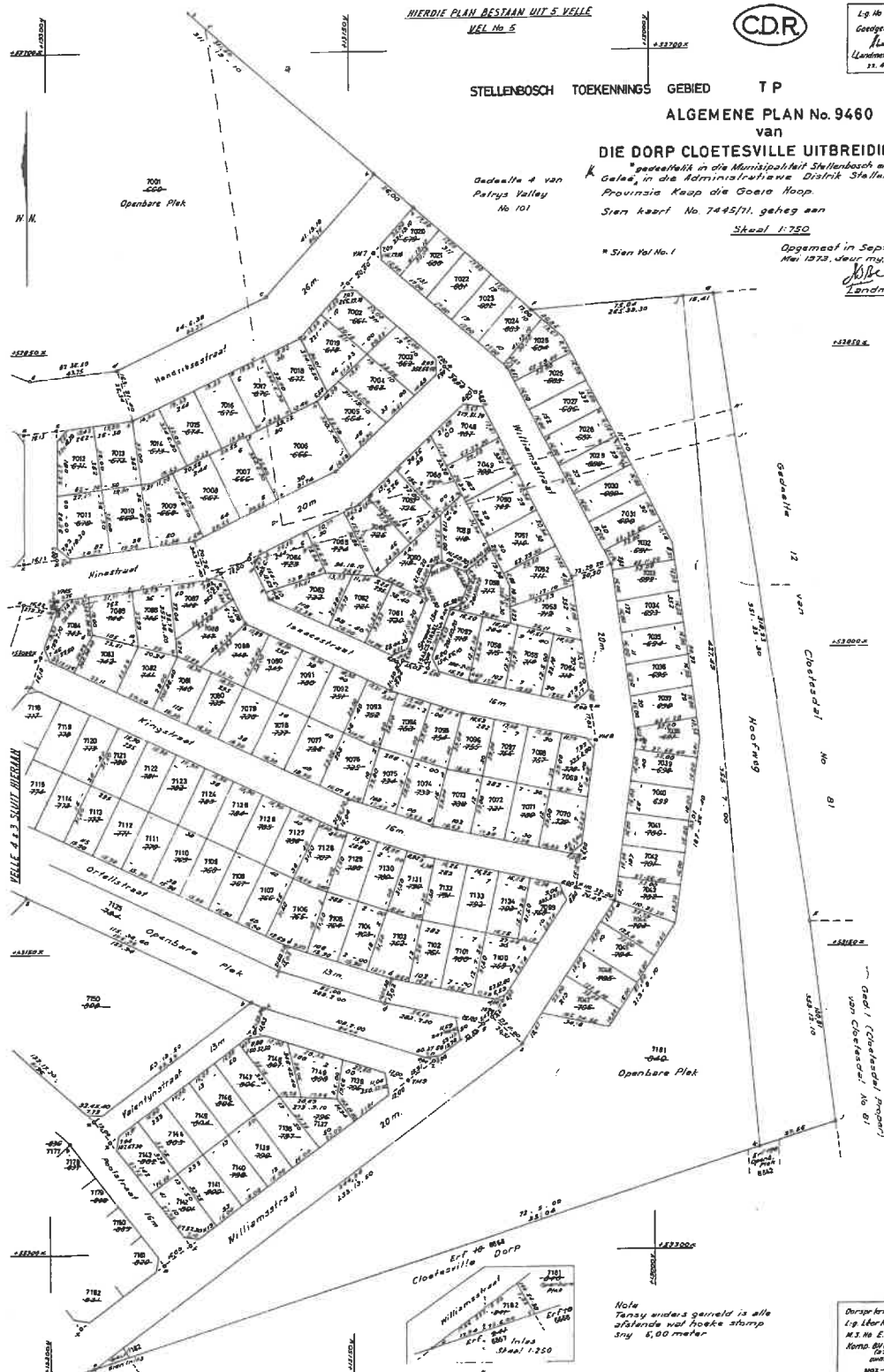
Sien kaart No. 7445/71, geteg aan

Skala 1:750

* *Sien* Vol No. 1

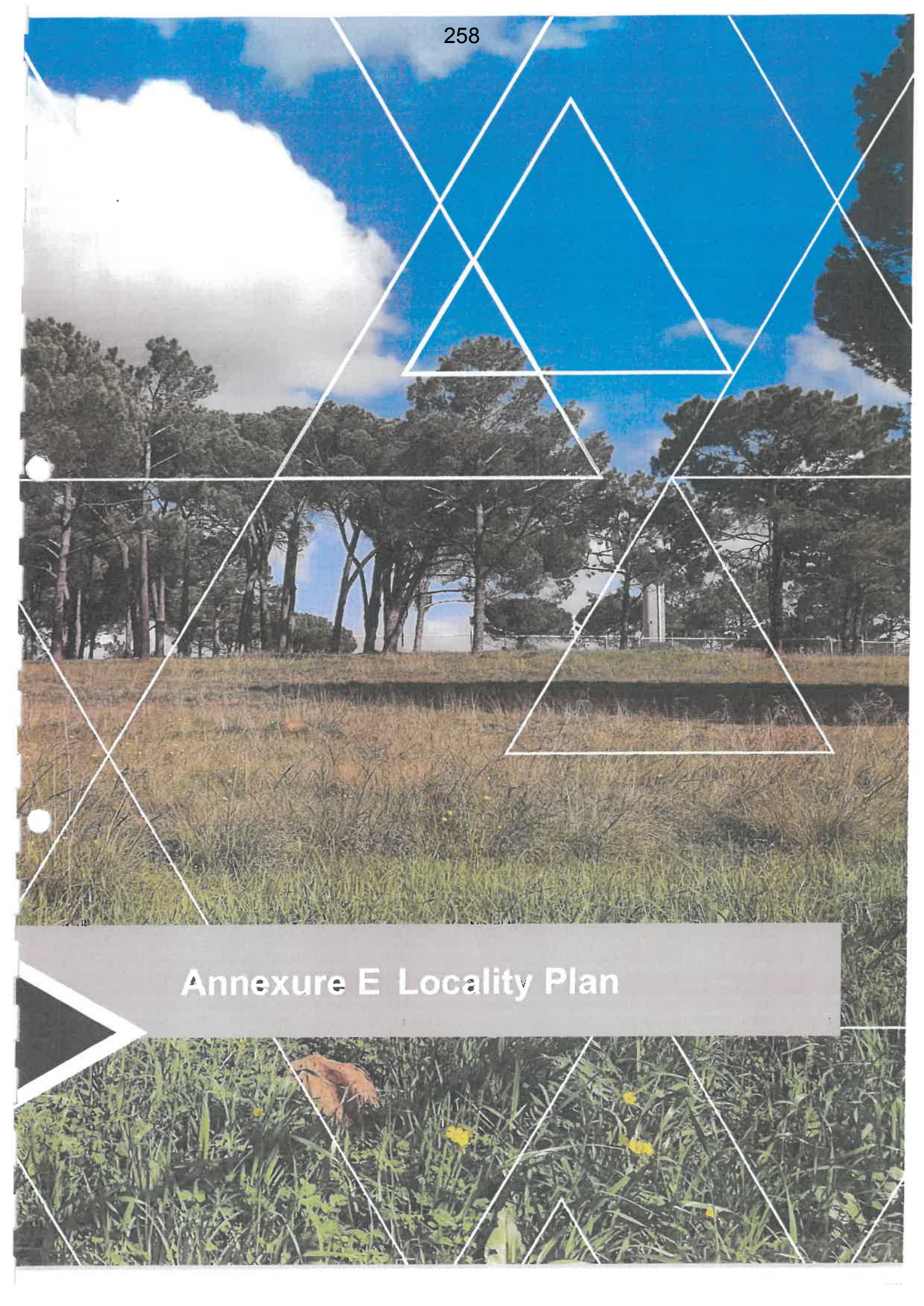
Agreement in Sept 1971 -
 Mei 1973, Jour my.
 K. R. etc

N. Beatty
Landmeter

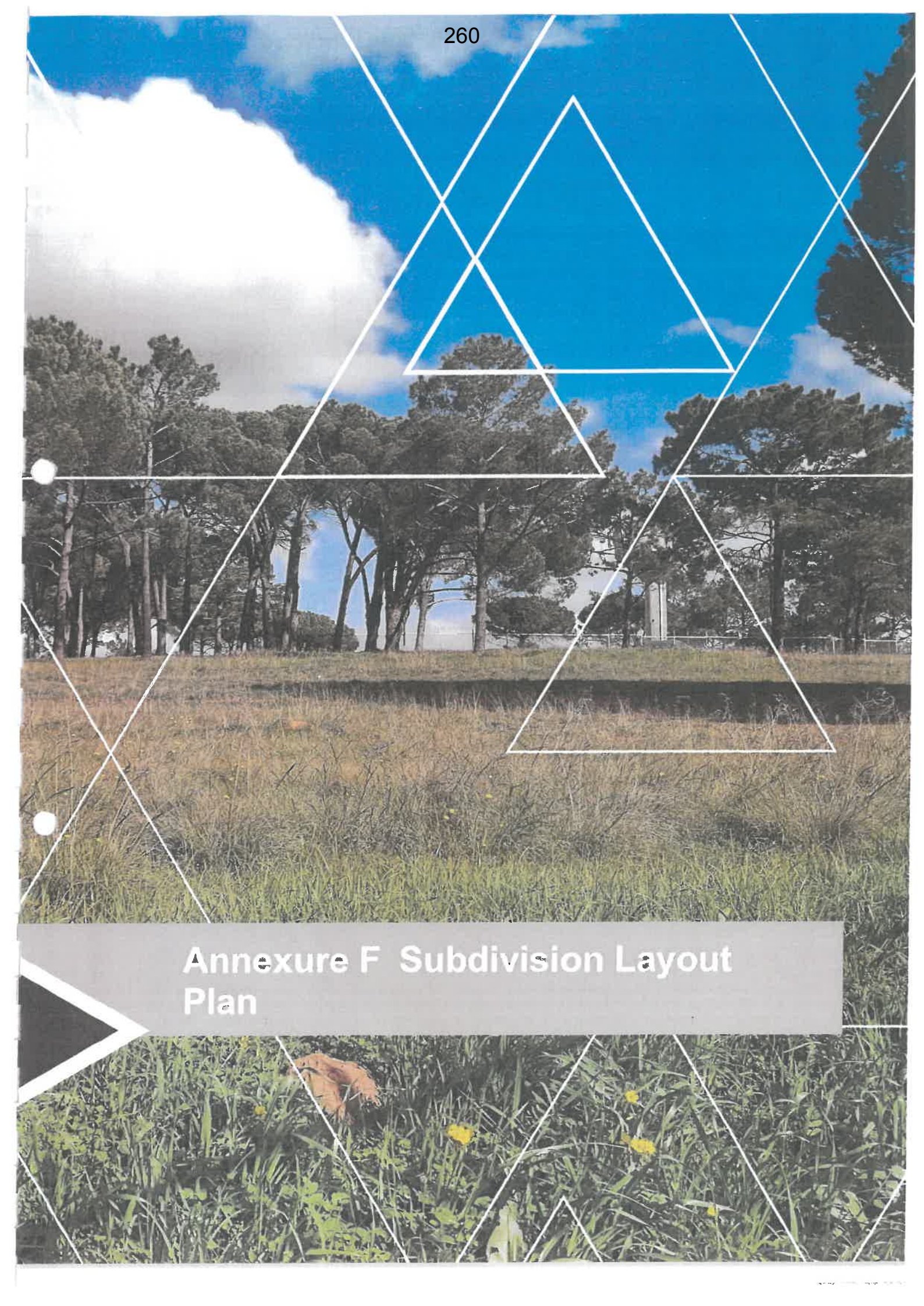


Note
Tensy anders gearield is alle
afstande wat hoeke stamp
sny 5,00 meter

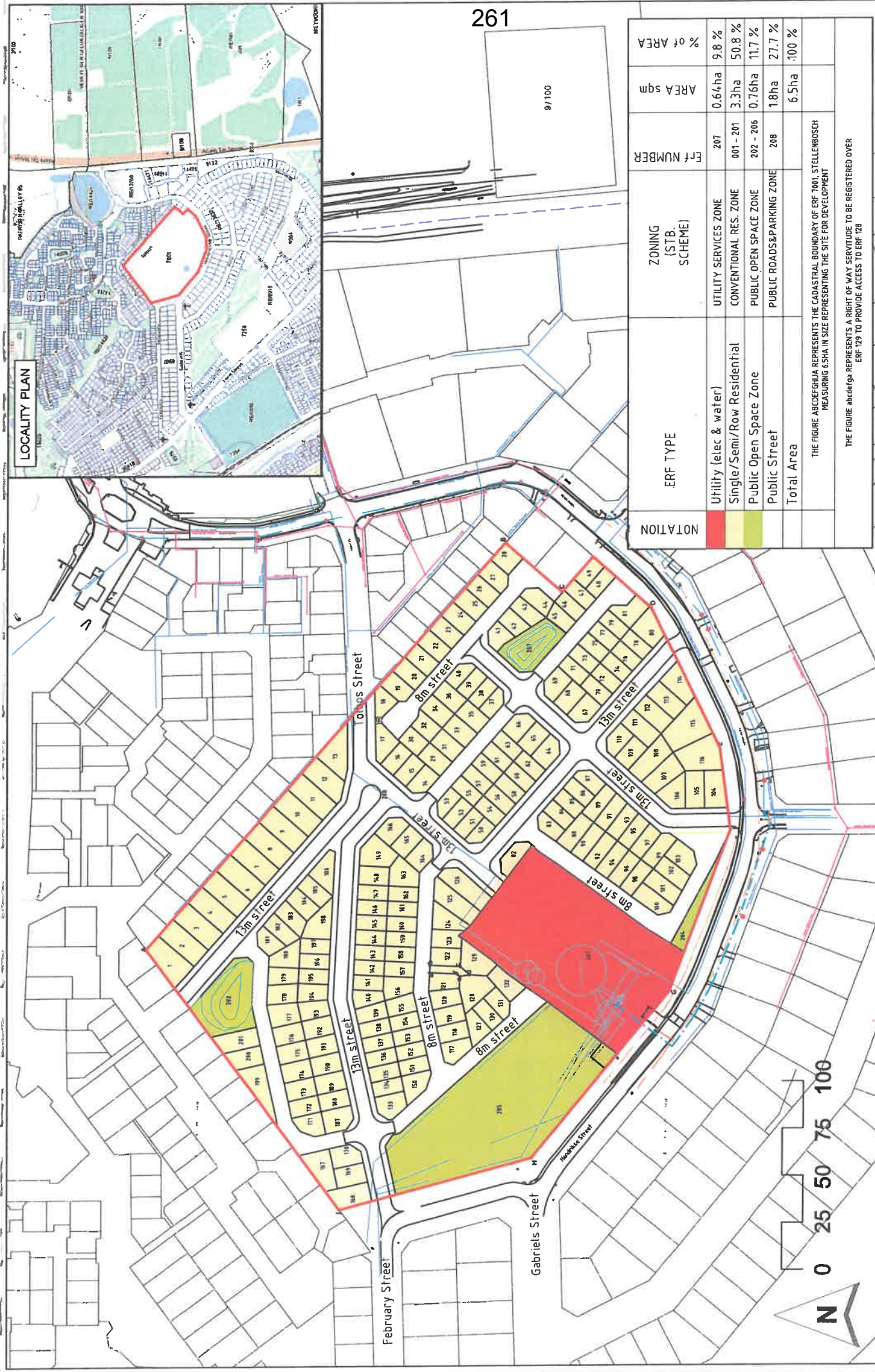
Dorspr. krt. No 7645/75
L: g. Lber No. Stel. 81
M. 3. No E. 2630/75
Kortp. 040408 + 040
07755 (0777)
00000743 (0777)
MOX - (02) (0794)
1345 (0788)
1342 (0784)
07848
07816



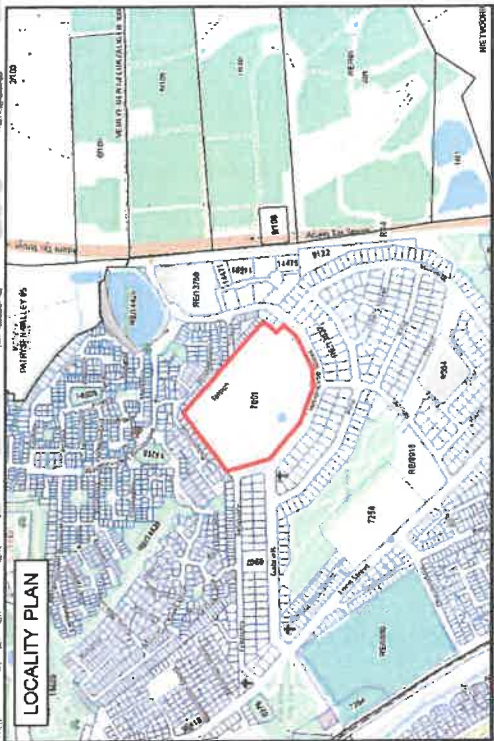
Annexure E Locality Plan



Annexure F Subdivision Layout Plan



LOCALITY PLAN



261

ERF TYPE	ZONING (STB. SCHEME)	EFF NUMBER	AREA sqm	% of AREA
Utility (elec & water)	UTILITY SERVICES ZONE	207	0.64ha	9.8 %
Single/Semi/Row Residential	CONVENTIONAL RES. ZONE	001 - 201	3.3ha	50.8 %
Public Open Space Zone	PUBLIC OPEN SPACE ZONE	202 - 206	0.76ha	11.7 %
Public Street	PUBLIC ROADS&PARKING ZONE	208	1.8ha	27.7 %
Total Area			6.5ha	100 %

THE FIGURE ABCDEFGHIA REPRESENTS THE CADASTRAL BOUNDARY OF ERF 1001, STELLENBOSCH MEASURING 6.5HA IN SIZE REPRESENTING THE SITE FOR DEVELOPMENT

THE FIGURE ABCDEFGHIA REPRESENTS A RIGHT OF WAY SERVITUDE TO BE REGISTERED OVER ERF 129 TO PROVIDE ACCESS TO ERF 128

NOTATION



ZUTARI
IMPACT. ENGINEERED.

STELLENBOSCH
MUNICIPALITY • UMAMPAALA • MUNISIPALITEIT

CLIENT
ERF 7001
STELLENBOSCH

PROJECT
CLOETESVILLE DEVELOPMENT FRAMEWORK

TITLE
SUB DIVISION & ZONING

DRAWN
ATB

DESIGNED
ATB

REVIEWED
RS.

DATE
10/01/2010

REVISION DETAILS
REV 10/01/2010

DISCLAIMER
IF CONSTRUCTION DRAWINGS ARE ISSUED UNDESIGNED, THE MASTER WITH THE ORIGINAL APPROVAL WILL BE HELD AT THE EDITOR'S OFFICE OF THE APPROVER

SCALE
N.T.S.

APPROVED
[Signature]

DRAWING No.
1001918

DATE
23/11/30

Annexure G Zoning Certificate



STELLENBOSCH

STELLENBOSCH • PNIEL • FRANSCHHOEK

MUNISIPALITEIT • UMASIPALA • MUNICIPALITY

DIRECTORATE: PLANNING & ECONOMIC DEVELOPMENT

Our Ref : 7001
 Contact per : A. Gwintsa
 Contact no. : (021) 808 8681
 Date : 29 September 2023

ZONING CERTIFICATE

Erf 7001 Stellenbosch, Administrative District of Stellenbosch, Province of the Western Cape

1. ZONING SCHEME PROVISIONS APPLICABLE TO THE SUBJECT PROPERTY

In accordance with the Stellenbosch Zoning Scheme Bylaw 2019, the base zone allocated to the above property, is:

PUBLIC OPEN SPACE ZONE.

In terms of the provisions of the said Bylaw, this base zone may provide for the following Primary, Additional and Consent land uses:

PRIMARY USES PERMITTED	ADDITIONAL USES (TECHNICAL APPROVAL) Land development requiring technical approval in terms of Section 15 of the Stellenbosch Land Use Planning Bylaw, 2015	CONSENT USES (APPLICATION REQUIRED) Land development requiring approval in terms of Section 15 of the Stellenbosch Land Use Planning Bylaw, 2015
<ul style="list-style-type: none"> • Open space • Natural environment • Private road • Occasional use (one event/ year) 	<ul style="list-style-type: none"> • Rooftop base telecommunication station 	<ul style="list-style-type: none"> • Camping site • Cemetery • Employee housing • Freestanding base telecommunication station • Indoor sport • Market • Occasional use (>one event/year) • Outdoor sport • Tourist accommodation establishment • Tourist facilities

2. PERMITTED LAND USES ATTACHED TO THE SUBJECT PROPERTY

The land uses which are permitted on the subject property in accordance with the zoning provisions and the approvals granted and on record, are the following:

- a) All primary land uses as per zoning scheme Bylaw.
- b) No additional, consent or temporary land uses have been approved on the subject property.

3. LAND USE RESTRICTIONS

This property may only be used for the permitted land uses detailed above and for no other purpose.

The above land uses are subject to various definitions, development parameters and restrictions contained in the applicable zoning scheme, a copy of which is available on the Stellenbosch Municipality website at <https://stellenbosch.gov.za/planning-portal/>.

4. STATUS OF THE ZONING CERTIFICATE

- a) A Zoning Certificate is not a legal mechanism to vest any land use rights and where there are any discrepancies between the zoning information contained in this certificate and any current Municipal decision on the permitted land use rights and any qualification thereon, such Municipal decision on the land use rights will override the contents of this zoning certificate.
- b) The permitted land use rights attached to the subject property does not exempt the owner/occupier from compliance with any other statutory requirement which may be applicable to the subject property, inclusive of restrictive title deed conditions,



Director: Planning and Economic Development

CHAPTER 18: PUBLIC OPEN SPACE ZONE**181. Zone name and designation on map**

- (1) The Public Open Space zone may be referred to by the code (POS) and shall be indicated on the zoning map in bright green (Colour code 171, 255, 3).

182. Purpose of the zone

- (1) The purpose of this zone is to make provision for land which vests in the Municipality as a 'public place' and which is intended to be used for:
- (a) active or passive public recreational and public amenity purposes; or
 - (b) creating a desired townscape, or visual open space for residents; or
 - (c) serving as an open space which also accommodates riverine corridors and other similar natural features; or to
 - (d) serve as an open space which accommodates extensive municipal services in a landscaped or natural setting, such as stormwater detention ponds and overland stormwater corridors.

183. Land use within this zone

- (1) The following land uses are permitted in this zone:

Primary Uses	Additional Uses (technical approval)	Consent Uses (application required)
<ul style="list-style-type: none"> • Open space • Natural environment • Private road • Occasional use (one event/ year) 	<ul style="list-style-type: none"> • Rooftop base telecommunication station 	<ul style="list-style-type: none"> • Camping site • Cemetery • Employee housing • Freestanding base telecommunication station • Indoor sport • Market • Occasional use (>one event/year) • Outdoor sport • Tourist accommodation establishment • Tourist facilities

- (2) One or more of the abovementioned primary uses are permitted on a land unit at the same time.

184. Rooftop and freestanding base telecommunication stations

- (1) A rooftop base telecommunication station in this zone is an additional use and a freestanding base telecommunication station may only be erected if a consent use application is approved by the Municipality.
- (2) A rooftop base telecommunication station antennae may not extend more than 3 meters in height above the part of the building that it is attached to unless otherwise approved by the Municipality when granting technical approval.
- (3) Any base station attached to the antennae shall be accommodated within the envelope of the building itself or inside its roof structure and shall not be visible from a public road, unless otherwise approved by the Municipality when granting technical approval.
- (4) The mast of a freestanding base telecommunication station may not extend more than 30 meters in height above existing ground level.

- (5) The height of any structures and buildings associated with a freestanding base telecommunication station, excluding the masts, may not exceed 1 storey unless otherwise approved by the Municipality when granting its consent.
- (6) The Municipality may request that a pre-electromagnetic radiation test be commissioned to accompany the application.
- (7) The Municipality may require appropriate context-specific screening to mitigate the impact of such infrastructure.

185. Building development parameters in this zone

- (1) The following building lines, coverage and height shall apply to buildings within this zone:

Building type	Street boundary building lines (m)	Common boundary building lines (m)	Coverage	Height
All buildings	5m	5m	20% or as restricted in SDP	1 storey

186. Boundary walls and fences

- (1) The height of any masonry wall, excluding the entrance structure and columns, may not exceed 1 meter.
- (2) A fence comprising of only wire or steel palisade (painted charcoal, black or dark green) may not exceed 2,1 meters.
- (3) No brick piers shall be permitted in wire or steel palisade fences and only the entrance gate structure may be of solid brick structures which shall not be higher than 3,5 meters for a maximum distance of 10 meters on both sides of the entrance gate.
- (4) The general development parameters relating to boundary walls and fences in section 23 shall also apply.

187. Site development plan

- (1) A site development plan may be required by the Municipality for any primary use.
- (2) If trading areas in this zone are demarcated in terms of the Municipality's Informal Trading Policy or By-law, a consent use application and site development plan is not required for this activity.
- (3) A site development plan shall be required for a consent use application and shall serve as the development parameters for such use once approved.

188. Construction environmental management plan

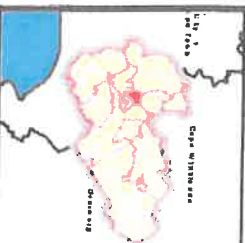
- (1) The Municipality may require that a construction environmental management plan is submitted for approval prior to building plan approval for the construction of new buildings in this zone.

189. Development charges in this zone

- (1) The Municipality may impose development charges for any additional use or consent use application in accordance with Planning Law.

1:4 513,99

Legend



Stellenbosch Municipality
Planning & Economic Development
Created by: Corporate GIS
Date: 2023/09/29

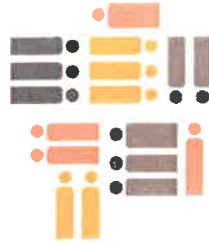


Author: Stellanbosch Municipality



Stollenboach Municipality
Street Address:
71 Plain Street, Stollenboach, 7600
Tel: 021 508 8658

**Annexure H SACPLAN Registration
Certificate**



The South African
Council *for* Planners
S A C P L A N

REGISTRATION CERTIFICATE

Issued in terms of Section 13(4) of the Planning Profession Act, 2002
(Act 36 of 2002)

This is to Certify that

Cornelis Rudolf Schroder

ID number: 7805315089081

is registered as a

Professional Planner

in terms of the Planning Profession Act, 2002 and is authorised to act as such
in accordance with the said Act and the Rules prescribed thereunder.

Issued under the Seal of the Council



REGISTRATION NUMBER:
A/151/2009

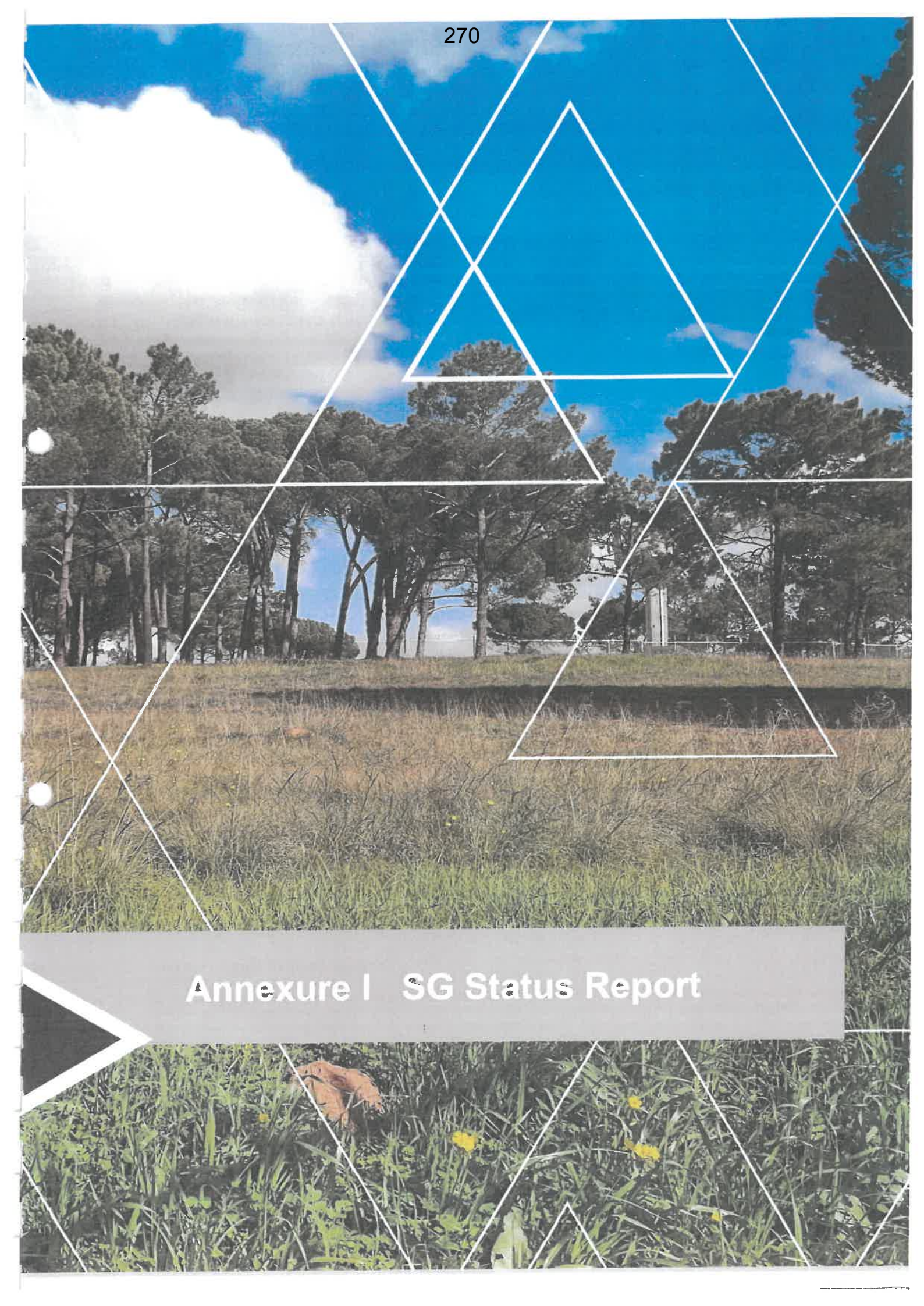
CHAIRPERSON

REGISTRAR

Date of Issue: 02-11-2023

The registered person remains in good standing with SACPLAN for the
period ending as stipulated herein.

This certificate is valid until: **30-06-2024**



Annexure I SG Status Report

(R S A)

Tel: (021) 467 4800

Fax: (021) 465 3008

SURVEYOR GENERAL-WESTERN CAPE
PRIVATE BAG X9028
CAPE TOWN
8000

2023-10-02

DAVID HELLIG & ABRAHAMSE
PROFESSIONAL LAND SURVEYORS
PO BOX 910
CAPE TOWN
8000

MY REF: STEL. 81 v.6 p347

Your ref: S384/22
Dated: 2023-09-28

**Note: THIS STATUS REPORT
IS VALID FOR 3 YEARS.**

Attention: James Florence

Sir

**STATUS REPORT: CLOSURE OF REMAINDER OF PUBLIC PLACE ERF 7001
STELLENBOSCH**

1. The proposed closure of land as shown coloured Green on your attached Diagram represents: **PORTION OF ERF 7001 STELLENBOSCH**

It is shown as a **Public Place** in my records.
2. **FOR OFFICE USE** The following properties will be endorsed: **ERVEN 7001, 8963, 8964 AND 12214 STELLENBOSCH AND GENERAL PLAN NO. 6489/1998**
3. Endorsement fees amount to: **R 900-00.**
4. I require a copy of a diagram suitable for registration purposes, surveyed and framed by a land surveyor, of the following: **N/A**
5. A written consent (**accompanied by a sketch**) is required in terms of **Section 23(1) of the Stellenbosch Municipality's Municipal Land Use Planning By-Law 2015** for the amendment of **GENERAL PLAN NO: N/A**

Yours faithfully



D CLOETE
For SURVEYOR-GENERAL: WESTERN CAPE

FOR OFFICE USE

CERTIFICATE:
GAZETTE No.
DATED:

p

Friedlaender Burger & Volkmann, Land Surveyors

SYE		RIGTINGS-
Meter		HOEKE
A B	311,50	311 19 20
B C	80,76	41 19 10
C D	83,27	64 06 30
D E	43,75	82 36 50
E F	91,71	110 33 20
F G	114,15	129 32 00
G H	104,66	165 00 00
H A	172,36	233 34 00

L.G. No.

3122-87

Goedgekeur

H. van der Merwe

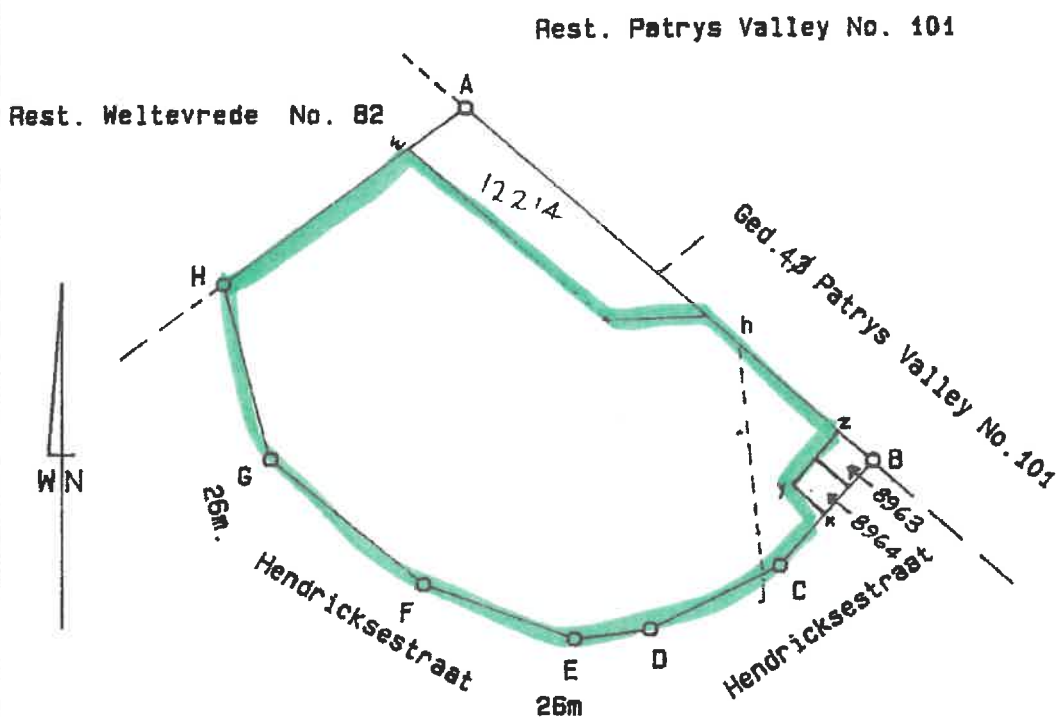
Landmeter-generaal

87/09/07

Beskrywing van Bakens.

A ----- 25mm pen teenaan spoorstaaf paal in ou baksteen baken

Alle ander bakens is 12mm. penne

Skaal 1: 4000

Die figuur A B C D E F G H

stel voor 8,6341 hektaar

ERF 7001 STELLENBOSCH (PUBLIEKE PLEK)

geleë in Cloatesville Dorp Uitbreiding No. 2

Administratiewe Distrik van Stellenbosch

Vervaardig kragtings Artikke 39 van Akte 9 van 1927 in April 1987

deur my

grond, synde

in die Munisipaliteit en

Provinsie Kaap die Goeie Hoop.

D. Burger
Landmeter

Hierdie kaart is gehêg aan

T/A
No. 56720/87

gedateer

t.g.v.

Registrateur van Aktes

Lêer No. Stel. 81

M.S. No. Vervaardig.

Komp. BHSZ-121 (6930)

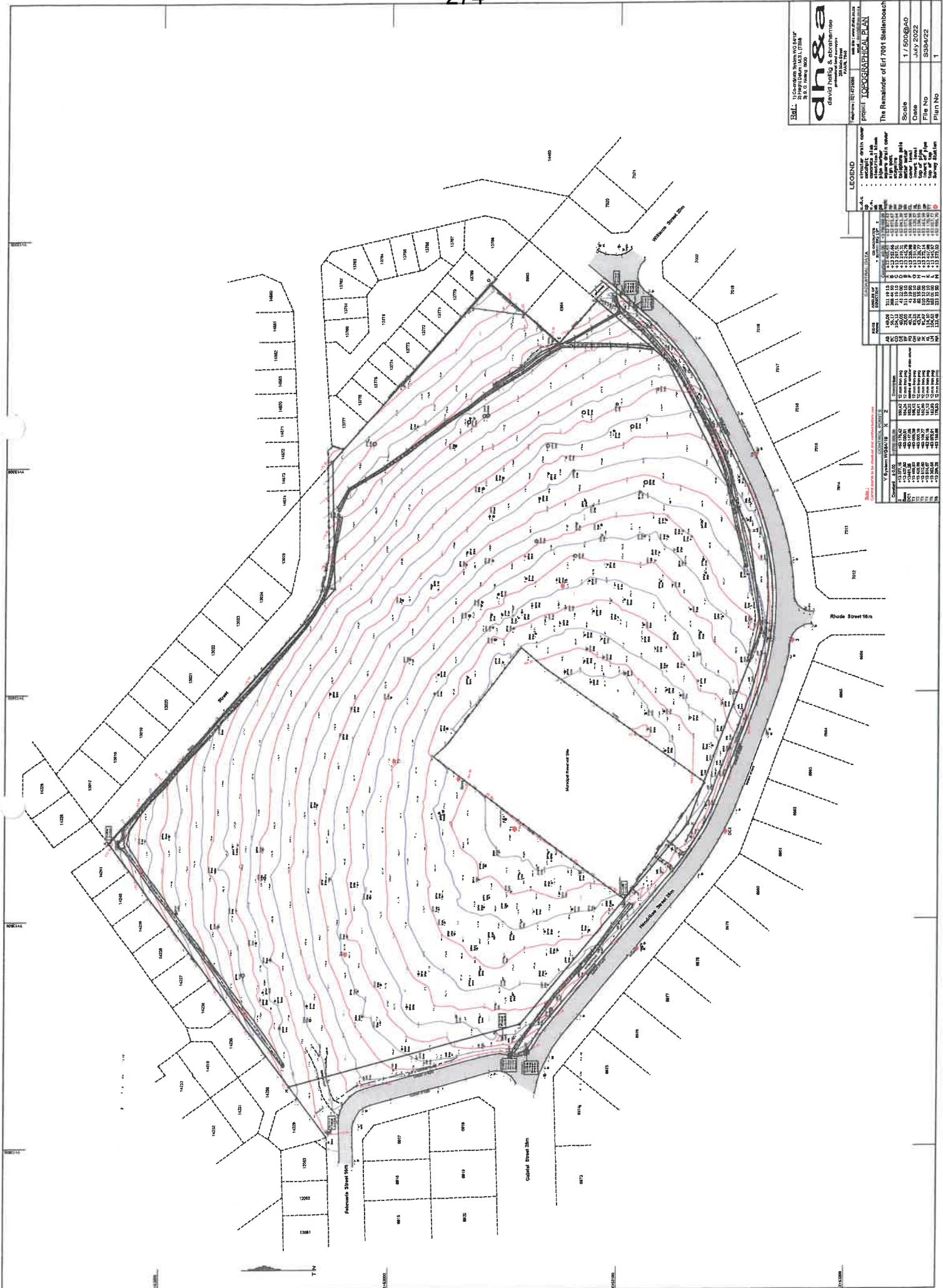
Alg. Plan TP No. 9460

Vel No. 3 en 5

SIEK VAN KAART

7001

**Annexure J Contour Cadastral
Basemap**



**Annexure K Telecommunication
Mast Infrastructure Drawings**


ATC SOUTH AFRICA

SITE NAME:

Cloetesville

BASE STATION NUMBER:

351316

REV DATE BY DESCRIPTION

REV1 10/11/2023 DL Final Issue

NOTES:

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3. SET-OUT POINTS AS INDICATED MUST BE CONFIRMED ON SITE AND PROPERTY BOUNDARY LINES AND TELECOMMUNICATION BASESTATION POSITION TO BE SET-OUT BY A PROFESSIONAL LAND SURVEYOR.
4. DRAWING MAY NOT BE SCALED. ALL DIMENSIONS TO BE CONFIRMED ON SITE BEFORE CONSTRUCTION MAY COMMENCE.

ENGINEER

NAME:

SIGNATURE:

STRICTLY COMPANY CONFIDENTIAL

PROPERTY DESCRIPTION:

Erf 7001, STELLENBOSCH

COORDINATES:

 LAT: 33°54'18.4"S
 LONG: 18°51'14.8"E

AMSL: 185m

PROJECT:

 NEW 10m x 10m TELECOMMUNICATION BASE STATION WITH
 25m TREE TOWER
 FOR ATC TOWERS (PTY) LTD

ADDRESS:

 HENDRIKUS ROOD, CLOETESVILLE
 STELLENBOSCH,
 7600
 Western Cape

COUNCIL:

 Stellenbosch Municipality
 PROPERTY OWNER:
 PRIVATE

 100 Oak Street, Suite 100, Stellenbosch, 7600, Western Cape, South Africa
 Tel: 021 708 1848
 Email: info@urbansolution.co.za
 Web: www.urbansolution.co.za

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 ALL WORK TO BE PERFORMED ACCORDING TO ITS SITE INFRASTRUCTURE SPECIFICATION

DRAWN: D. Lee

DATE: 10/11/2023

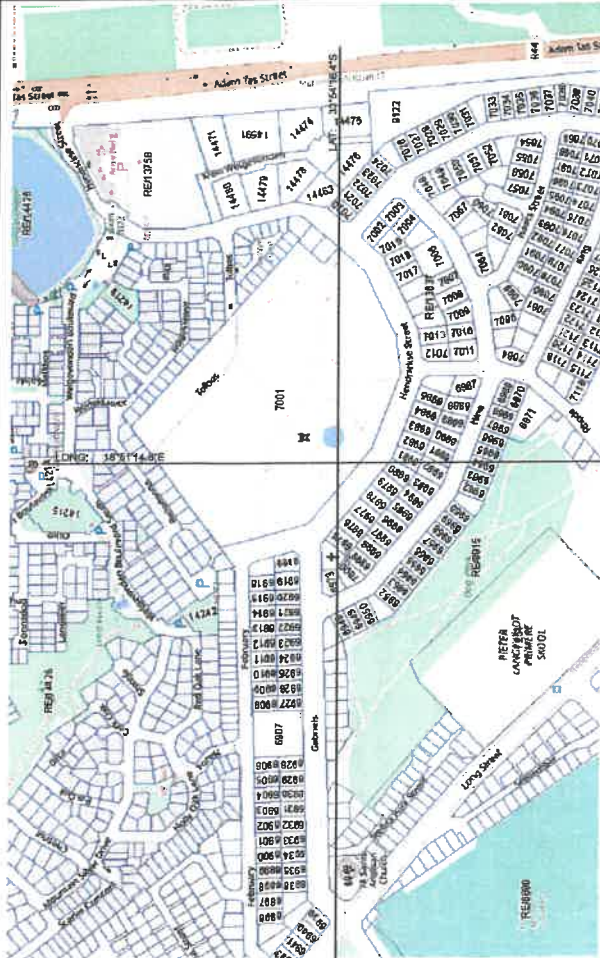
SCALE: NTS

REF. NO: BP-7001-REV1



LOCALITY PLAN

SHEET 1 OF 7



LONG: 18°51'14.8"E

LAT: 33°54'18.4"S

 Cloetesville
 Base Number: 351316


KANTOORAFSKRIF

TP 2460

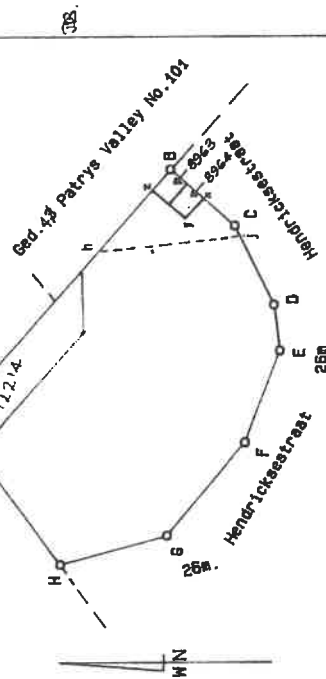
Prijelazender Burger & Volwassen Land Surveyors

SYE	RISTINGS- HEKKE	L.G. No.
A B	311 50 311 19 20	3122-87
B C	80 76 41 19 10	Geodeteur
C D	83 27 64 06 30	<i>W. van der Merwe</i>
D E	43 75 82 36 50	Landmeter-generaal
E F	91 71 110 33 20	27/09/07
F G	114 15 129 32 00	
G H	104 66 185 00 00	
H A	172 36 233 34 00	

Beskrifwing van Bakens.
A — 25mm pen teenaan spoorstaaf paal in ou baksteen bak
Alle ander bakens is 12mm. penne

Rest. Patrys Valley No. 101

Rest. Meltevrede No. 82



Die figuur A B C D E F G H
stel voorn. 8,6341 hektaar
ERF 7001 STELLENBOSCH (PUBLIEKE PLEX)
geleë in Cloeteville Dorp Uitbreiding No. 2 in die Munisipaliteit en
Administratiewe Distrik van Stellenbosch Provincie Kaap die Goeie Hoop.
Vervaardig Kragtings Artikie 39 van Akte 9 van 1927 in April 1987
deur wy *W. van der Merwe*
Landmeter

Hierdie kaart is gehag aan
T/A
No. 66720/07
ge-dateer
t.g.v.

Registrateur van Aktes

Aig. Plan TP No. 9460

Vel No. 3 en 5

SIEKKE VAN KANT

7001

ATC SOUTH AFRICA

SITE NAME:

Cloeteville

BASE STATION NUMBER:

351316

REV DATE BY DESCRIPTION

REV 1 10/11/2023 DL First Issue

NOTES:

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- ALL DIMENSIONS MUST BE SEALED. ALL DIMENSIONS TO BE CONFIRMED ON SITE BEFORE CONSTRUCTION MAY COMMENCE.

ENGINEER

NAME:

SIGNATURE:

STRICTLY COMPANY CONFIDENTIAL

PROPERTY DESCRIPTION:

ERF 7001, STELLENBOSCH

COORDINATES:

33.594556,
18.334111

ANSL:

185m

PROJECT:

NEW 10m x 10m TELECOMMUNICATION BASE STATION WITH
25m TREE TOWER
FOR ATC TOWERS (PTY) LTD

ADDRESS:

HENDERBOSCH ROAD, CLOETEVILLE,
STELLENBOSCH,
7000
Western CapeCOUNCIL:
Stellenbosch Municipality
PROPERTY OWNER:
PRIVATE

100 Gb. New Road,
Stellenbosch,
7000,
Western Cape,
South Africa
Tel: 021 709 1846
Fax: 021 709 1846
Email: info@urban-solutions.co.za
Website: www.urban-solutions.co.za

DRAWING MUST NOT BE SCALED. ONLY FIGURED DIMENSIONS TO BE USED. DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCEMENT OF WORK.
ALL WORK TO BE PERFORMED ACCORDING TO ITS SITE INFRASTRUCTURE SPECIFICATION

DRAWN: D. Lee

DATE: 10/11/2023

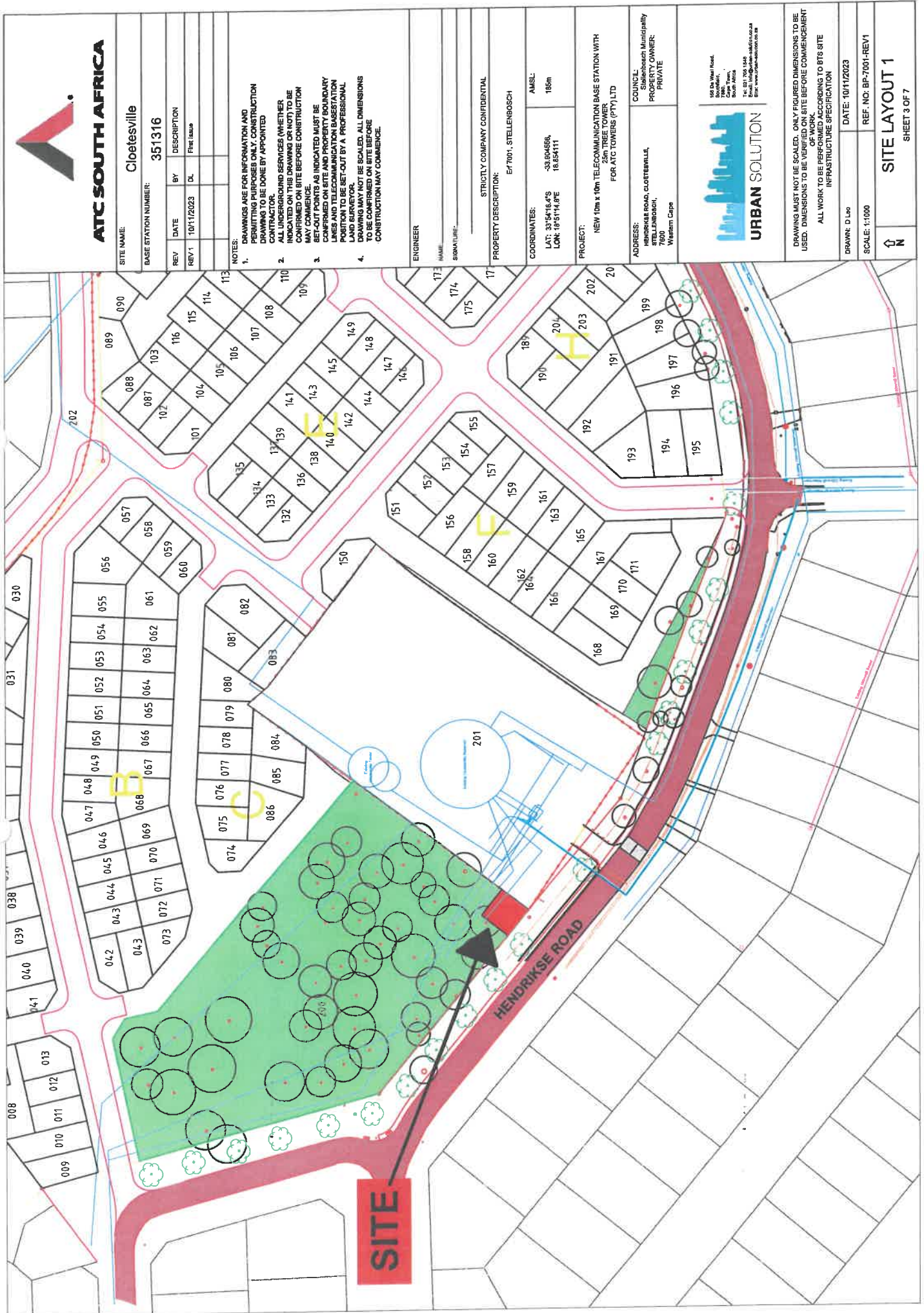
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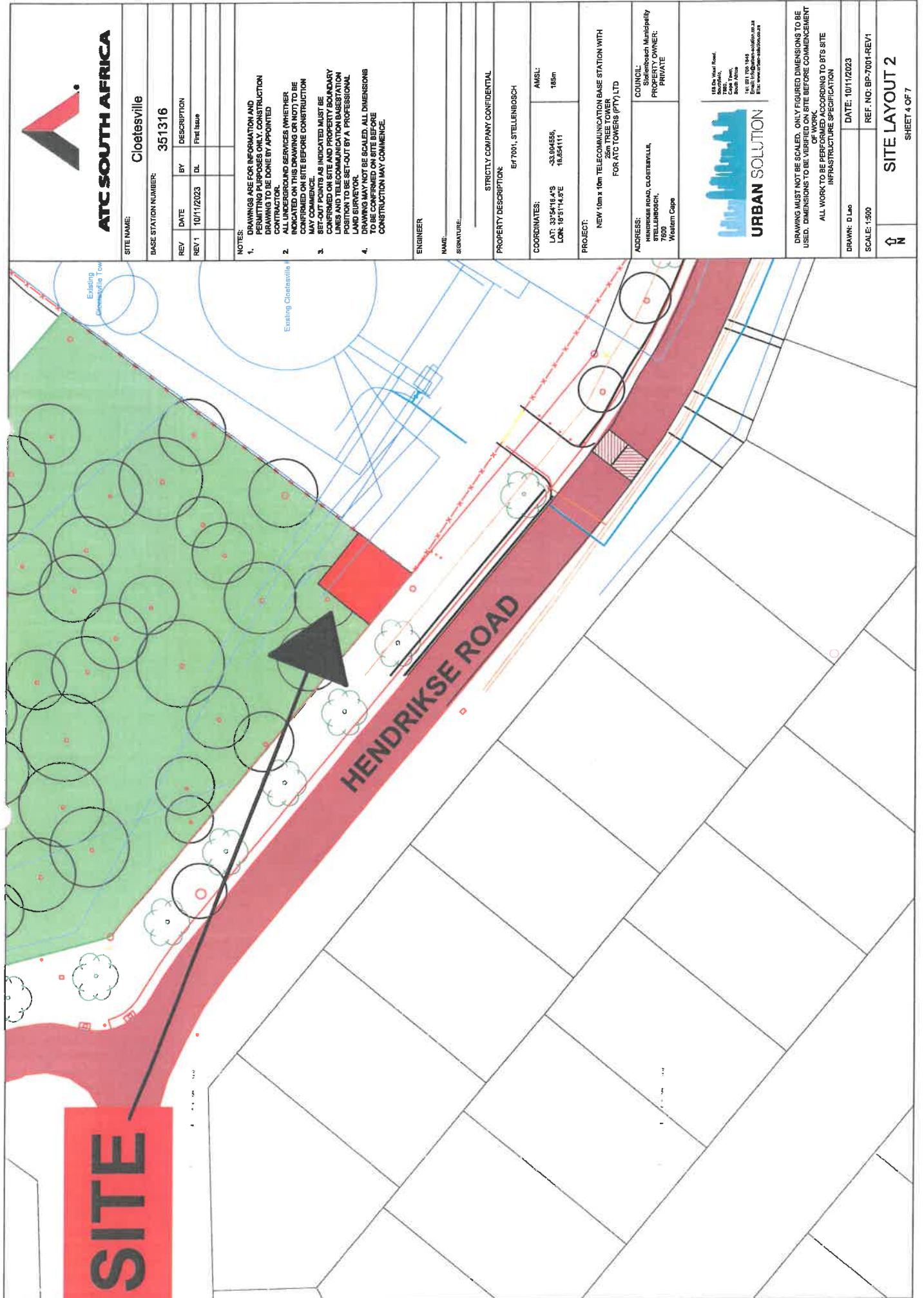
REF. NO. BP-7001-REV1

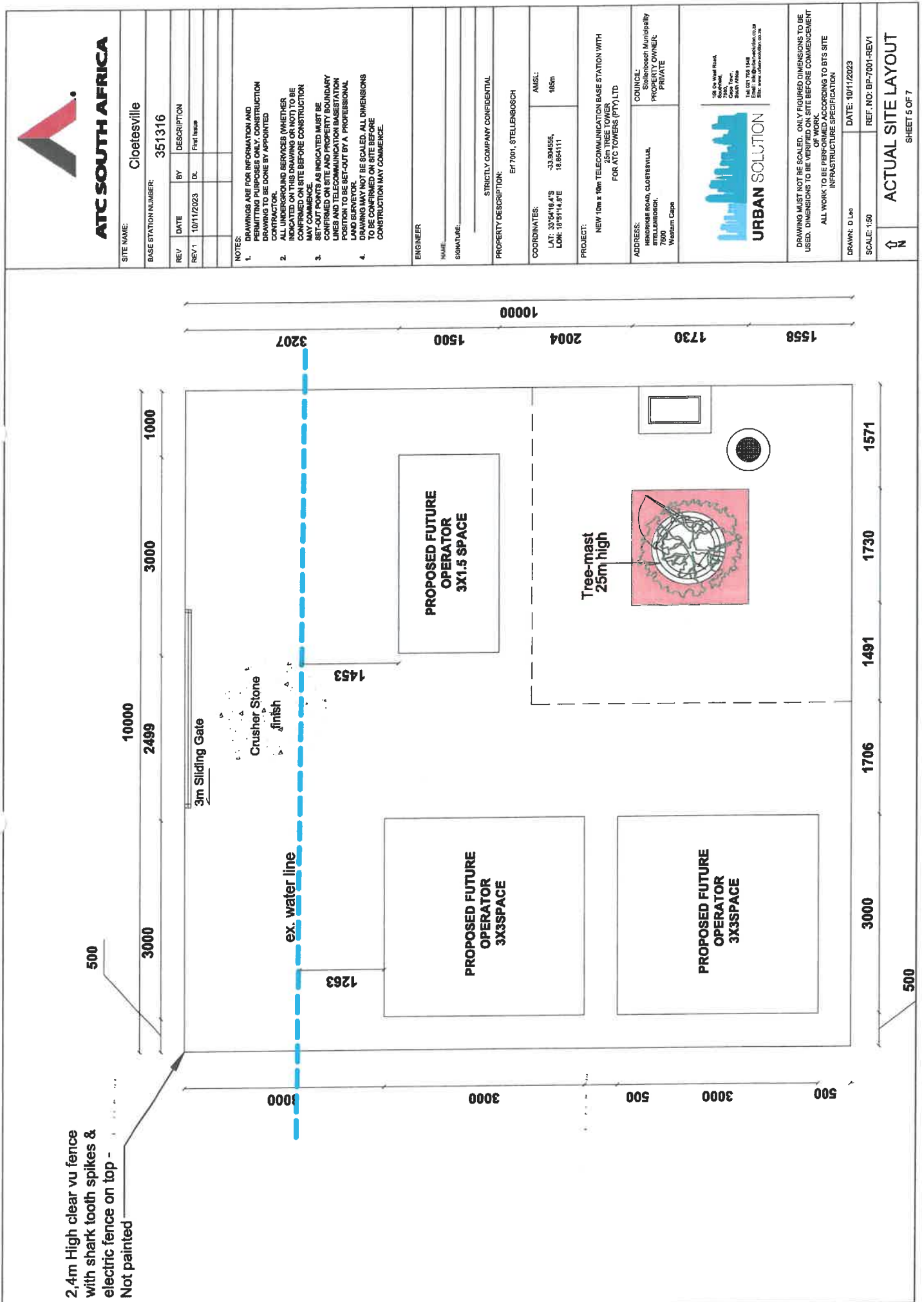


CADASTRAL INFORMATION

SHEET 2 OF 7









ATC SOUTH AFRICA

SITE NAME:

Cloetesville

BASE STATION NUMBER:

351316

REV 1 10/11/2023 BY DL First Issue

NOTES:

1. DRAWINGS ARE FOR INFORMATION AND NOT FOR CONSTRUCTION. ANY CONSTRUCTION DRAWING TO BE DONE BY APPOINTED CONTRACTOR.
2. ALL UNDERGROUND SERVICES (WHETHER INDICATED ON THIS DRAWING OR NOT) TO BE CONFIRMED ON SITE BEFORE CONSTRUCTION MAY COMMENCE.
3. SET POINTS AS INDICATED MUST BE CONFIRMED ON SITE AND PROPERTY BOUNDARY LINES AND TELECOMMUNICATION BASESTATION POSITION TO BE SET-OUT BY A PROFESSIONAL LAND SURVEYOR.
4. DRAWING MAY NOT BE SCALED. ALL DIMENSIONS TO BE CONFIRMED ON SITE BEFORE CONSTRUCTION MAY COMMENCE.

ENGINEER

NAME:

SIGNATURE:

STRICTLY COMPANY CONFIDENTIAL

PROPERTY DESCRIPTION:

817 7001, STELLENBOSCH

COORDINATES:

LAT: 33°54'16.4"S
LON: 18°15'14.8"E

AMSL:

165m

PROJECT:

NEW 10m x 10m TELECOMMUNICATION BASE STATION WITH ANTENNAE FOR ATC TOWERS (PTY) LTD

ADDRESS:

HENDRIKS ROAD, CLOETESVILLE,
7800
Western Cape

COUNCIL:
Stellenbosch Municipality
PROPERTY OWNER:
PRIVATE



65 De Water Road,
2005, Cape Town,
South Africa
Tel: 021 705 1545
Email: info@urbansolution.co.za
Web: www.urbansolution.co.za

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DRAWN: D. Leo

DATE: 10/11/2023

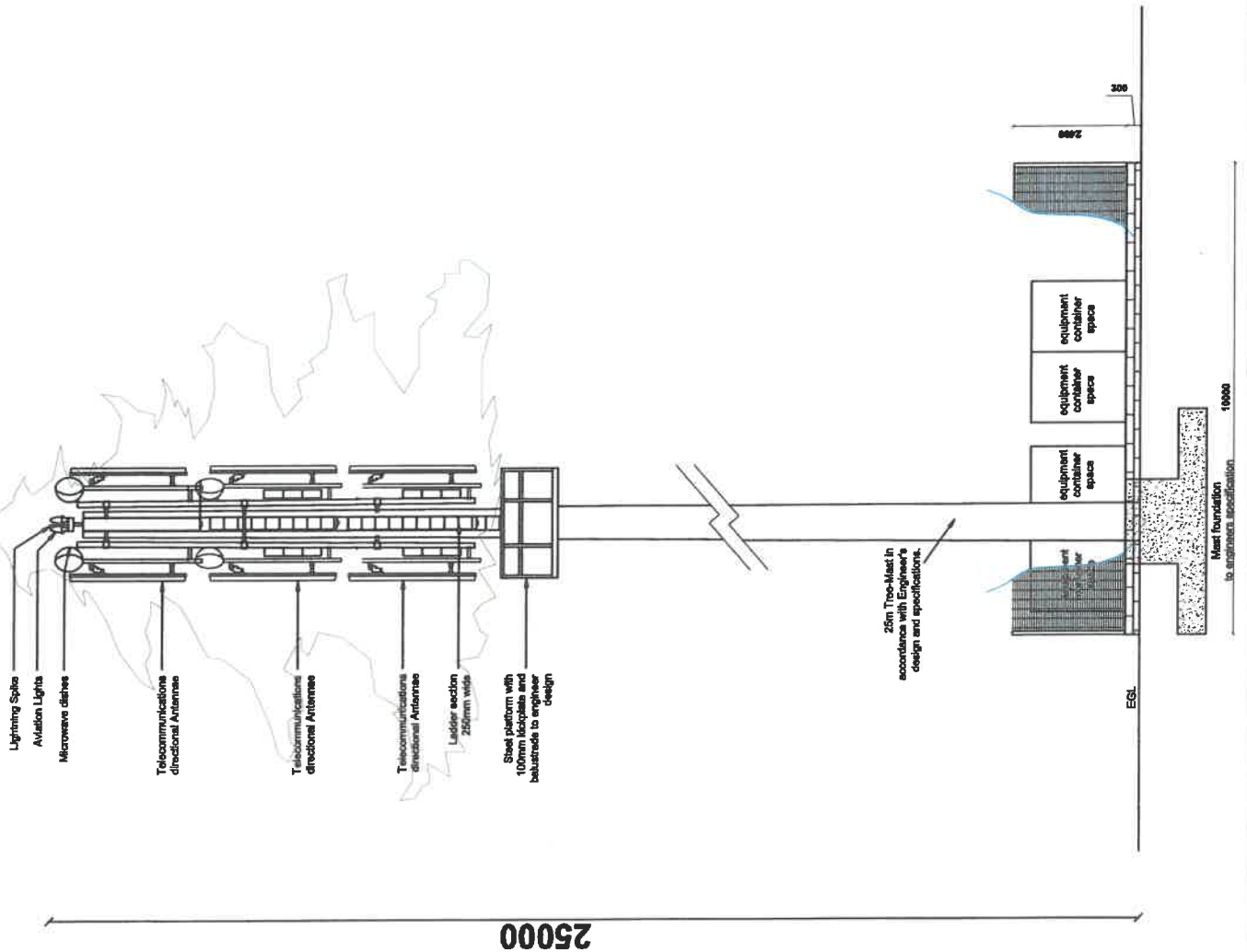
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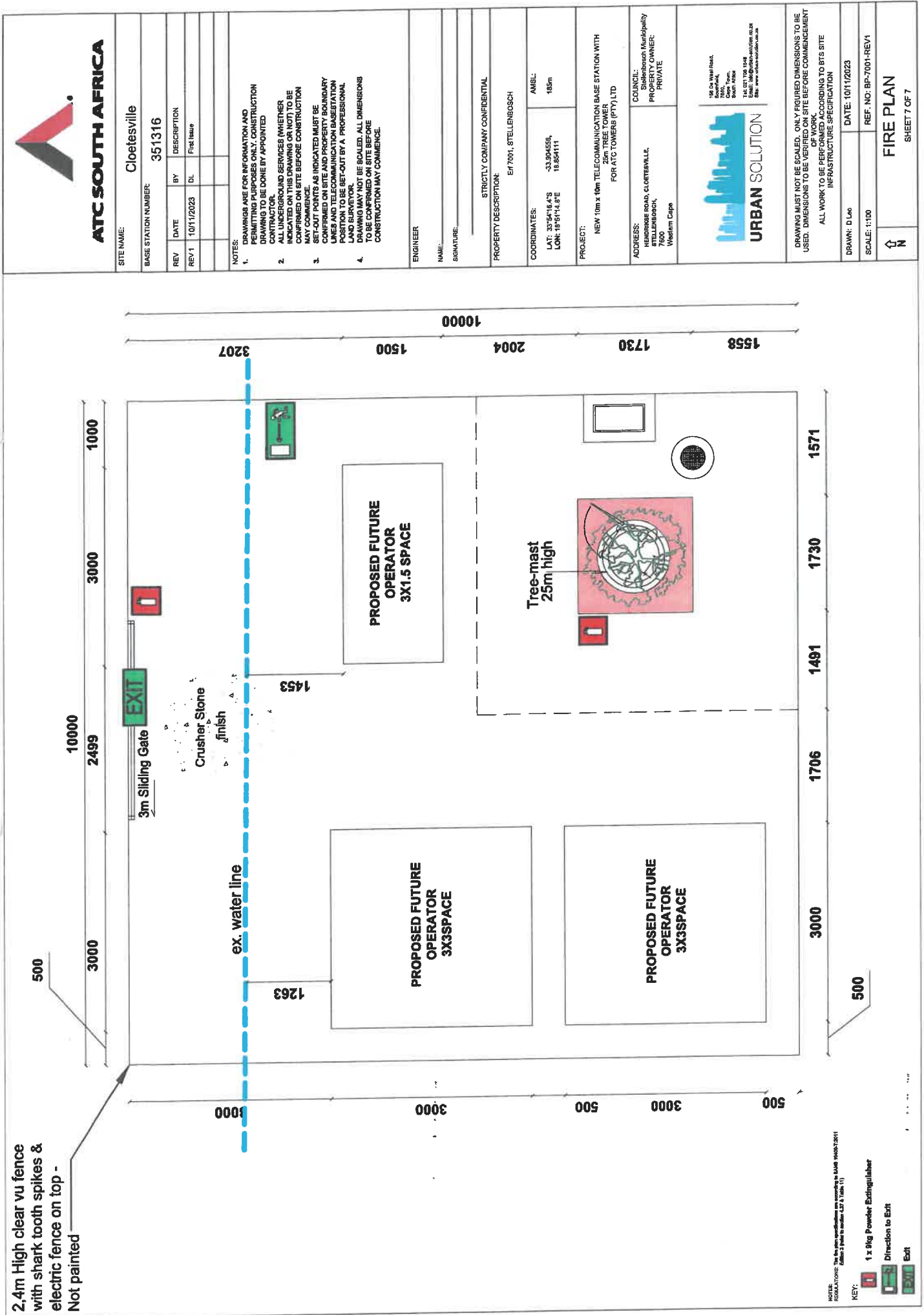
REF. NO. BP-7001-REV1

↑

ELEVATION PLAN

SHEET 6 OF 7





**Annexure L Environmental
Authorisation**



**Western Cape
Government**

Department of Environmental Affairs and Development Planning

D'mitri Matthews

Directorate: Development Management, Region 1

D'mitri.Matthews@westerncape.gov.za | Tel: 021 483 8350

REFERENCE: 16/3/3/6/1/B4/5/1246/22

DATE: 3/8/2022

The Director
Guillaume Nel Environmental Consultants
P. O. Box 2632
PAARL
7620

Attention: A. Gouws

Tel.: (021) 870 1874
Email: a.p@gnec.co.za

Dear Sir

RE: APPLICABILITY OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) ("NEMA") ENVIRONMENTAL IMPACT ASSESSMENT ("EIA") REGULATIONS, 2014 (AS AMENDED), WITH RESPECT TO THE PROPOSED LOW-COST HOUSING DEVELOPMENT ON ERF 7001, CLOETESVILLE

1. The electronic correspondences dated July 2022, as received by this Department on 6 July 2022, refers.
2. Following the review of the new contained in the electronic correspondence, this Department notes the following:
 - 2.1.1 The proposal entails the construction of a low-cost housing development on Erf No. 7001. The property is currently zoned as a utility services zone as the Welgevonden reservoir is situated in the centre of the site. The development footprint of the low-cost housing will be approximately 59 550m² and the remainder of the site will continue to be occupied by the water reservoir and associated water tower footprint (5785m²).
 - 2.1.2 According to aerial imagery available to the Department, the site has been used for and zoned for utility services. The site is therefore regarded as being inside the urban area.
 - 2.1.3 The site would have been comprised of Swartland Shale Renosterveld, an ecosystem listed as critically endangered in terms of Section 52 of the National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) ("NEMBA"), however, the site has been transformed and no longer contains indigenous vegetation.
 - 2.1.4 There are no watercourses present on site.
3. Your attention is therefore drawn to the listed activities in terms of the NEMA EIA Regulations 2014 (as amended) as defined in Listing Notices ("LN") 1, 2 and 3 of 7 April 2017. Be advised that, based on the information provided, the proposed low-cost housing development on the abovementioned property, **does not** constitute any listed activities as defined in terms of the NEMA EIA Regulations 2014 (as amended). Environmental Authorisation is therefore not required prior to the proposed development.

4. The above-mentioned is based on the following:
 - 4.1 The site is located within an urban area;
 - 4.2 There are no watercourses on the site;
 - 4.3 The site was not used for agricultural purposes on or after 1 April 1998; and
 - 4.4 There is no indigenous vegetation remaining on site.
5. However, should any future development of the consolidated portions trigger any listed activity in terms of the EIA Regulations, 2014 (as amended), an application form for Environmental Authorisation must be submitted to the Competent Authority and the Environmental Authorisation obtained prior to the development proposal being commenced with on the proposed site. The relevant application forms are available on this Department's website: www.westerncape.gov.za/eadp.
6. You are further reminded of your general duty of care towards the environment in terms of section 28(1) of NEMA which states:
 "Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment."
7. Please note that the applicant must comply with any other statutory requirements that may be applicable to the undertaking of the activity.
8. Kindly quote the abovementioned reference number in any future correspondence concerning the proposed development.
9. This Department reserves the right to revise or withdraw its comments and request further information based on any information received.

Yours faithfully

Marbe

Digitally signed by
Marbe Coetzee

pp **Coetzee**

Date: 2022.08.03
08:17:57 +02'00'

HEAD OF COMPONENT

ENVIRONMENTAL IMPACT MANAGEMENT SERVICES: REGION 1

DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND DEVELOPMENT PLANNING

Copy to: (1) S. van der Merwe (Stellenbosch Municipality)

Email: Schalk.VanderMerwe@stellenbosch.gov.za



Annexure M Geotechnical Report



KANTEY & TEMPLER
CONSULTING ENGINEERS

ESTABLISHED 1953

**REPORT ON PHASE 1 GEOTECHNICAL SITE
INVESTIGATION AT THE ERF 7001
DEVELOPMENT IN CLOETESVILLE,
STELLENBOSCH**

OCTOBER 2022

K&T PROJECT REFERENCE: 16706GG



KANTEY & TEMPLER
CONSULTING ENGINEERS

ESTABLISHED 1953

Client Name	Zutari Consulting Engineers
Document Title	REPORT ON PHASE 1 GEOTECHNICAL SITE INVESTIGATION AT THE THE ERF 7001 DEVELOPMENT IN CLOETESVILLE, STELLENBOSCH
K&T Project Reference	16706GG
File Name	16706GG Erf 7001 Cloetesville
Prepared By	Leroi Celliers
Reviewed By	Frank Du Plessis

Report Revision Record

Revision	Date	Description
0		

This report has been prepared by Kantey & Templer (Pty) Ltd, with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.

For and on behalf of Kantey & Templer (Pty) Ltd

For and on behalf of	
Kantey & Templer (Pty) Ltd	
Approved by:	_____
Signed:	_____
Position:	_____
Date:	_____

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**REPORT ON PHASE 1 GEOTECHNICAL SITE INVESTIGATION AT THE ERF 7001
DEVELOPMENT IN CLOETESVILLE, STELLENBOSCH**

TABLE OF CONTENTS

ITEM	PAGE
1. INTRODUCTION & TERMS OF REFERENCE	1
2. PROJECT INFORMATION	1
3. SITE DESCRIPTION	2
4. NATURE OF THE INVESTIGATION	2
4.1 Field Investigation	2
4.2 Laboratory Investigation	3
5. SITE GEOLOGY AND SUBSOIL PROFILE	4
5.1 General Geology	4
5.2 Subsoil Profile	4
6. groundwater conditions	5
7. EVALUATION OF INVESTIGATION RESULTS	6
7.1 Engineering and materials characteristics	6
7.1.1 Classification Tests	6
7.1.2 CBR Tests	7
7.1.3 Chemical Testing	8
7.1.4 Materials Utilisation Potential	8
7.2 Slope Stability and Erosion	9
7.3 Excavation Classification	9
7.4 Site Subsidiy Considerations	10
8. FOUNDATION RECOMMENDATIONS	12
9. SITE CLASS DESIGNATION	13
10. SITE DRAINAGE	13
11. SPECIAL PRECAUTIONARY MEASURES	14
12. CONCLUSIONS	14
13. GENERAL	15
 APPENDIX A	 TRIAL HOLE PROFILES
APPENDIX B	DCP TEST RESULTS
APPENDIX C	LABORATORY TEST RESULTS

EXECUTIVE SUMMARY

Erf 7001 Cloetesville has been identified for possible residential development which will comprise GAP housing (dwellings) located in terrain composed of and underlain at shallow depth by shales of the Tygerberg Formation, Malmesbury Group.

The subsoil profile, in general, is composed of naturally transported surficial soils which are resting on residual material which are in turn are underlain by weathered shales.

Conditions for the use of conventional foundations at shallow depth are considered favourable classifying as 'S' in terms of the NHBRC site class designation. Accordingly, founding options allow for conventional strip and slab-on-ground foundations.

Groundwater conditions are considered favourable with a perched water table developing during periods of high rainfall. Given the steep topography of the bulk of the site, erosion associated with surface runoff can be expected.

Development costs may need to be increased due to:

- the non-availability of materials suitable for re-use on site,
- the unfavourable subgrade conditions,
- the need for measures to control the shallow presence of groundwater/surface runoff.

REPORT ON PHASE 1 GEOTECHNICAL SITE INVESTIGATION AT THE ERF 7001 DEVELOPMENT IN CLOETESVILLE, STELLENBOSCH

1. INTRODUCTION & TERMS OF REFERENCE

In terms of written instructions, Kantey & Templer was requested by Zutari Consulting Engineers on behalf of the Stellenbosch Municipality to prepare a geotechnical report for Erf 7001 in Cloetesville, as part of establishing a Broad Conceptual Urban Design Framework and process to obtain planning and development rights.

It was required that the report be based in the relevant geotechnical aspects of Generic Specification GSFH-2 phase 1 of the National Department of Housing.

2. PROJECT INFORMATION

The following information was used or referred to:

- 1:50 000 Geological Map "Stellenbosch" 3318 and associated explanation booklet.
- Various current and historical Google Earth Images of the site.
- A 1:500 scale A0 survey drawing prepared by David Hellig & Abrahamse Professional land surveyor titled, "the remainder of Erf 7001 Stellenbosch" providing the cadastral layout of the erven, level contours, existing structures, roads, services and other noteworthy features.
- A series of documents indicating the position of the existing services in the vicinity of erf 7001 Stellenbosch.

It was stated that the development of ERF 7001 will consist of GAP housing the composition and extent of which are yet to be determined.

3. SITE DESCRIPTION

The Erf 7001 area identified for possible development comprises a 6,5ha site which is currently vacant with a water reservoir constructed in the centre of the erf. The erf is 'kidney' shaped measuring 400m in length and 200m in width.

The development area is located to the east of Cloetesville and is bounded by the Welgevonden Estate to the north and east, Hendrikse Road to the south and February Road to the west. These roads all provide access to the site.

Topographically the development area is located on a hill with sloping ground leading away from the elevated central portion of the site (area of existing water tower). Slopes are generally of a moderate fall.

Vegetation predominantly comprises low grasses and scattered concentrations of mature pine trees.

There is evidence that the site had previously been used to stage construction activities with imported material and precast elements noted along the south eastern portion of the site.

A drainage ditch had been cut along the northern part of the site probably for the control of surface run-off.

4. NATURE OF THE INVESTIGATION

4.1 Field Investigation

Following an initial inspection of the site for the identification of underground services, eight (8) machine dug trial holes were put down to depths of up to 2,8m below existing ground level at accessible positions within the development area.

Subsoil conditions were assessed by detailed visual examination of the in-situ materials exposed in the trial holes.

Dynamic Cone Penetrometer (DCP aka DPL) tests were carried out next to the trial holes. In this test a cone tipped steel rod is driven into the ground by means of a standardised falling weight the penetration per blow providing a useful indication of in-situ density.

Samples of the site soils were extracted from selected trial holes for further laboratory analysis.

The trial hole and DCP test positions are indicated on the attached layout diagram (number 16706GG/-01) whilst the trial hole profiles and DCP test results are given in the Appendices.

4.2 Laboratory Investigation

The soil samples recovered from the trial holes were submitted to an accredited laboratory, Steyn-Wilson Civil Engineering Laboratory, for geotechnical testing.

The following laboratory tests were undertaken, all in accordance with the South African Standard, Technical Methods for Highways (TMH), British Standards (BS) and/or other recognised International Standards.

- Soil Specimen Preparation, according to:
TMH1:1986 and B.S. 1377: Part 1:1990
- Chemical Testing, according to:
B.S. 1377: Part 3:1990, Chemical Tests
- Particle Size Distribution, according to:
TMH1:1986 Test Method A1 and A6
- Atterberg Limits, according to:
TMH1:1986 Test Method A2 to A4 and B.S. 1377:Part 2:1990
- California Bearing Ratio Testing, according to:
TMH1:1986 Test Method A7 and A8

Geotechnical testing on 'undisturbed' samples cut from the trial holes was not possible due to the friable nature of the subsoils and difficulty of retrieving suitably intact samples. Accordingly, tests were undertaken on 'disturbed' material only.

The laboratory test results are given in the test reports presented in the Appendices. The results are discussed in detail in the relevant sections of this report.

5. SITE GEOLOGY AND SUBSOIL PROFILE

5.1 General Geology

Based on published geological data, Cloetesville is known to be situated in terrain composed of and underlain at relatively shallow depth by shales (greywacke, phyllite and hornfells) of the Tygerberg Formation, Malmesbury Group. Mantling the shales are a variable cover of residual and naturally transported Quaternary age soils, the transported soils largely of colluvial origin.

5.2 Subsoil Profile

The Malmesbury Group Shales were encountered in all the trial holes with the exception of trial hole 6 where only residual soil was intersected to depth. The shales were intersected from as shallow as 0,30m over the area of trial hole 5 to 1,45 below existing ground level at trial hole 2 and found to be composed of completely to highly weathered steeply dipping, jointed very soft rock to locally soft rock shale.

The completely weathered rock locally presents as 'soil-like' residual clayey silt.

Rock was encountered at the following depths at each of the trial holes.

Area of Trial Hole 1	-	1,30m below existing ground level
Area of Trial Hole 2	-	1,45m below existing ground level
Area of Trial Hole 3	-	1,40m below existing ground level
Area of Trial Hole 4	-	1,00m below existing ground level
Area of Trial Hole 5	-	0,30 m below existing ground level
Area of Trial Hole 6	-	Not encountered
Area of Trial Hole 7	-	1,30m below existing ground level
Area of Trial Hole 8	-	1,30m below existing ground level

Mantling the rock are residual soils derived from the in-situ weathering and decomposition of the parent rock. The residual soils underly the site from 0,13m depth at trial hole 5 to 0,60m at trial hole 8 and consist of firm to stiff slightly sandy clayey silt often reflecting the bedding structure of the shale. Locally the shale tends to completely weathered very soft rock.

The upper up to 400mm of residual soils typically occur in the form of reworked soil containing occasional to scattered pedogenic ferruginous grit, gravel and larger concretions.

Naturally transported soils ranging in thickness from 0,13 to 0,47m was generally found to overly the residual soils. This material comprises loose to medium dense silty fine-grained sand to locally, sandy clayey silt containing occasional to scattered gravel grit and occasional cobble sized rock fragments.

Over localised areas (area of trial holes 6 and 8) imported fill was intersected to depths of between 0,13 to 0,40m depth, this ranging from silty sand with gravel and builders rubble to sandy clayey silt with pockets of crushed gravel.

Although digger refusal often occurred during excavation of the trial holes no rock of hard rock consistency was encountered during our field investigation.

6. GROUNDWATER CONDITIONS

Groundwater was not intersected in any of the trial holes, soil moisture generally ranging from slightly moist to moist.

As the field investigation was undertaken during the summer months, the groundwater conditions encountered should not be considered representative of conditions throughout the year.

During periods of sustained winter rains, a shallow perched water table will develop within the transported and reworked residual profile with strong subterranean seepages possible near/above the contact between the finer grained clayey/silty soils and the overlying more sandy materials. By implication, groundwater levels could rise to existing ground level, in particular along the lower lying parts of the site. Such seepages will be intersected in trenches and could emanate from the sidewalls of deep excavations or cuttings.

Consequently, box cuts (access roads), terraces and other excavations formed deeper than the existing ground level are likely to intersect groundwater during periods of high rainfall. Suitable drainage measures will therefore have to be provided for the control and removal of such water.

It should also be noted that during the rainy season, surface seepages are likely to result in unstable/matrassing subgrade conditions over access/construction roads and deep cut areas, this largely associated with either the waterlogged conditions of the upper more sandy soils and, in deep cut, the clayey moisture sensitive residual soils. It is thus evident that special attention will need to be paid to drainage, not only of the building areas but also the surrounds, during final design of the bulk earthworks and fixing of site levels.

In addition to the seepages discussed above, the impervious clayey subsoils will limit water penetration and result in *significant surface runoff and ponding over large parts of the areas prepared as cut platforms.*

The timing of construction must be planned with the fluctuating groundwater conditions in mind and the construction of foundations, trenching, terracing, subgrade preparation etc. programmed for the dry summer months where possible.

7. EVALUATION OF INVESTIGATION RESULTS

7.1 Engineering and materials characteristics

7.1.1 Classification Tests

The results of the classification tests undertaken are presented in the table below.

Position	Depth (m)	Origin	Gravel	Sand	Silt	Clay	LL	PI	LS	Potential Exp.
TH1	0.22-0.50	Residual	14	37	29	20	23	7.9	3.9	low
TH1	0.75-1.30	Residual	4	41	31	24	31	11.1	5.1	low
TH2	0.25-0.65	Residual/Transported	35	38	27		23.3	6.9	2.9	-
TH2	0.65-1.45	Residual	22	31	23	24	28.5	9.7	4.8	low
TH4	0.00-0.40	Transported	3	68	29		NP	NP	0	-
TH4	0.40-0.75	Residual/Transported	16	55	29		25.8	10.1	4.8	-
TH6	0.55-0.75	Residual	8	43	25	24	29.3	10.2	4.9	low
TH7	0.22-0.85	Residual	18	41	23	18	25.5	9.1	4.4	low
TH8	0.13-0.65	Transported	3	65	32		NP	NP	0	-

Table 1 Classification Test Results

From the above it can be seen that the residual soils contain a significant percentage of soil fines with a combined clay and silt content ranging from 29 to 55%. The Plasticity Index ranges from 7,9 to 11,1 This indicates that the residual soils are highly moisture sensitive. Using the Van der Merwe method of assessing 'Potential Expansiveness', the residual soils classify as "low expansive" material.

The transported materials which overly the residual soils, although essentially a fine grained sandy soil containing gravel, proved to be, with a Plasticity Index of NP (non-plastic) and with a fines content of 29/32%, non-expansive. It must be accepted though that these soils will remain moisture sensitive.

7.1.2 CBR Tests

The results of the CBR tests indicated the following:

Position	Depth	MDD	OMC	GM	%Swell	PI	LS%	CBR Compaction					COLTO Class.
								100%	98%	95%	93%	90%	
TH2	0.25-0.65	2011	8.3	1.81	1.10	6.9	2.9	11	7	4	3	2	<G9
TH4	0.00-0.40	2160	10.2	1.48	0.00	NP	0.0	20	16	12	9	7	G9
TH4	0.40-0.75	2036	11.2	1.70	1.39	10	4.8	15	12	7	5	3	<G9
TH8	0.13-0.65	2083	10.1	1.02	0.00	NP	0.0	21	16	11	10	8	G8

Table 2 CBR Test Results

The CBR results confirmed that the transported soils will classify as a G8/G9 quality material which will be suitable for use as bulk fill or lower selected subgrade in roadways *where compacted to 93 to 95% of the Modified AASHTO density*. It must however be stressed that this material often contains deleterious organic material which will have to be removed prior to placement and compaction.

The residual soils containing ferruginous gravel classify as a soil not meeting the specification for a G10 material. This material should therefore, where removed from cuttings, trenches, etc, be spoiled off site or be used for landscaping purposes.

7.1.3 Chemical Testing

Chemical testing was undertaken on various site soils to establish the pH and conductivity based 'aggressiveness' towards services and buried structures.

Position	Depth	pH	Conductivity (S/m)
TH1	0.75-1.30	5.2	0.008
TH2	0.65-1.45	5.4	0.006
TH4	0.40-0.75	5	0.055
TH6	0.55-0.75	8	0.014
TH7	0.22-0.85	4.6	0.044

Table 3 Results of Chemical testing

The above results should be used to select suitable protective measures for concrete and steel services and structures in the ground with due regard for the soil 'aggressiveness'.

7.1.4 Materials Utilisation Potential

Based on the results of the laboratory testing, our observations on site and experience gained analysing similar soils, the following assessments can be made with regard to the utilisation potential of the site soils:

Transported Material - The transported will be suitable for re-use on site once the organic material has been removed. These soils will conform to the strength specification of a G8-G9 quality material once compacted to 93 to 95% of the Modified AASHTO density and will accordingly be entirely suitable for use as structural fill / subgrade / fill platform material when compacted to the required densities. It should be noted however that these soils contain significant percentages of soil fines and that compaction must be undertaken at optimum moisture content (O.M.C). This may be difficult to achieve during unfavourable weather conditions.

Residual Soils - The residual soils contain significant volumes of fines (silt and clay) which will render the material very highly moisture sensitive. Compaction to any meaningful density will therefore be extremely difficult if not impossible, in

particular where earthworks are undertaken during wet weather conditions. Accordingly, it is recommended that these soils either be used for landscaping purposes or be spoiled off site.

None of the materials encountered on site will classify as base, sub-base or pipe bedding. These materials will where be required, have to be imported from commercial sources.

7.2 Slope Stability and Erosion

Given relatively high consistency of the site soils, and despite the relatively steep fall across parts of the site, no slope stability issues are anticipated.

Surface erosion is however considered a risk. It is accordingly recommended that good engineering principals be followed when designing runoff measures for the site. These should include:

- prevention of concentrated runoff over exposed/unpaved areas
- lining of channels
- allowance for adequate discharge and capacity for the stormwater system.

7.3 Excavation Classification

Given the 'unconsolidated' nature of the fill, transported and residual soils profile, no significant problems should be experienced in excavating these soils using conventional earthmoving equipment. The bulk of the site soils will accordingly classify as "soft" excavation in terms of SANS 1200D. The underlying very soft to soft rock shale underlying the site from 0,30m depth will however require significantly more effort to remove. This material will classify as 'Intermediate excavation'.

For hand excavation classification in terms of Watermeyer 1997, the more granular transported and cohesive residual soils will all classify at worst, as soft excavation Class A material. Although these soils are considered excavatable by hand, it must be noted that very soft to soft rock underlying the site from shallow depth would make excavation by hand extremely difficult.

7.4 Site Subsidy Considerations

Using the schedule of generic subsidy variations for site and founding conditions as provided in the GFSH-2 Specification, the relevant categories of subsidy variation have been evaluated in the table below:

CATEGORY OF SUBSIDY VARIATIONS - SITE CONDITIONS	VERIFICATION CRITERIA	CONDITIONS PREVALENT ON SITE
Seepage / groundwater		
Category 1	Permanent or perched water table less than 1,0 m below ground surface	YES
Category 2	Permanent or perched water table less than 1,5 m below ground surface.	NO
Erodability of soil		
	Uppermost soil horizon (0 to 750mm) over erf is classified in terms of the Unified Soil Classification as SP, SM, CL or CH and average slope of erf measured in any direction is steeper than or equal to 1:7,5.	YES
Difficulty of servicing of land due to slopes		
Type 1 site	Average slope measured along a 100 metre line in any direction from any of the boundaries of the erf is flatter than 1:100.	NO
Type 2 site	Average slope measured across the erf in any direction exceeds 1:20 but is flatter than or equal to 1:10.	NO
Type 3 site	Average slope measured across the erf in any direction exceeds 1:10 but is flatter than or equal to 1:7,5.	NO
Type 4 site	Average slope measured across the erf in any direction exceeds 1:7,5 but is flatter than or equal to 1:5.	YES

Type 5 site	Average slope measured across the erf in any direction exceeds 1:5	NO
Difficulty of excavation		
Type 1 condition	Average slope measured across the erf in any direction is flatter than or equal to 1:10 and between 10 and 40% of material to a depth of 1,5 metres below pre-development level is classified as hard rock excavation.	NO
Type 2 condition	Average slope measured across the erf in any direction is flatter than or equal to 1:10 and in excess of 40% of material to a depth of 1,5 metres below pre-development level is classified as hard rock excavation.	NO
Type 3 condition	Average slope measured across the erf in any direction is steeper than 1:10 and the material to a depth of 1,5 metres below pre-development level is classified as Boulder Class B excavation.	NO
Type 4 condition	Average slope measured across the erf in any direction is steeper than 1:10 and the material to a depth of 1,5 metres below pre-development level is classified as Boulder Class A or Hard Rock excavation.	NO
Precautionary measures in sites underlain by dolomites/limestones	Class P(dolomites/limestones-D2/D3) site class designation in accordance with 2.5 and 2.8 of Part 1 of Section 2 of the NHBRC Home Building Manual	N/A

CATEGORY OF SUBSIDY VARIATIONS - FOUNDING CONDITIONS	VERIFICATION CRITERIA	CONDITIONS PREVALENT ON SITE
Expansive soils	Site class designations classified in accordance with 2.5 of Part 1 Section 2 of the NHBRC Home Building Manual	S
<ul style="list-style-type: none">Class H1Class H2Class H3		
Compressible and potentially collapsible soil		
<ul style="list-style-type: none">Class C1Class C2		
Compressible soils		
<ul style="list-style-type: none">Class S1Class S2		
Variable		
<ul style="list-style-type: none">Class P (Dolomites/Limestones - D2)Class P (Dolomites/ Limestones - D3	Class P site class designation in accordance with 2.5 and 2.8 of Part 1 of Section 2 of the NHBRC Home Building Manual.	N/A
<ul style="list-style-type: none">Class P (Mining subsidence)	Class P site class designation in accordance with 2.5 of Part 1 of Section 2 of the NHBRC Home Building Manual.	N/A

8. FOUNDATION RECOMMENDATIONS

The assessment of founding conditions in terms of Watermeyer, Tromp and the Joint Structural Division is based on a single level structure supported on a standard spread footing (600mm wide) exerting a bearing pressure of 50kPa at 0,5m depth. Based on the results not only of our field investigation but also the results of the laboratory testing, settlements of between 0 and 10mm are anticipated where founding as stated above. Founding conditions at the site can accordingly be classified as 'S'.

Foundation design must however still allow for the following:

- Strip footing or slab-on-ground foundations.
- Foundation pressures not to exceed 50kPa.
- Good site drainage.

In addition to the above, consideration should be given to:

- nominal reinforcement of the foundation brickwork (between footings and surface beds) using brickforce in each layer;
- reinforcement of the brickwork above door and window openings (making liberal use of brickforce);
- the introduction of strategically positioned control joints (vertical) in all long masonry walls, again for the introduction of some flexibility in the structures.

9. SITE CLASS DESIGNATION

Given that settlements to 10mm are anticipated where founding at shallow depth, the site will classify as 'S' in terms of the NHBRC site class designation.

10. SITE DRAINAGE

To ensure satisfactory performance of the various buildings and structures proposed, it is of vital importance that effective surface drainage of the site is achieved. Allowance must therefore be made in the design to ensure the rapid removal of runoff from the site and to prevent either the direct discharge or ponding of water in the immediate vicinity of the structures.

Sub-surface drainage may need to be installed locally along selected sections of the building areas for the collection and removal of groundwater seepages. The extent, location and depth of installation will be subject to on site assessment of subgrade conditions during construction of the building platforms.

Although the permeability of the site soils has not been verified by way of in-situ testing, it is suggested that for the design of subsurface drainage:

- the transported soils be considered marginal drainage material with a coefficient of permeability (k) of no better than 10^{-5} m/s,
- the more clayey residual material and soft rock phyllitic shales be considered practically impervious with a coefficient of permeability of 10^{-8} to 10^{-9} m/s.

It is suggested that the final drainage design be based on site specific permeability tests with the above values only used for preliminary design and costing purposes.

11. SPECIAL PRECAUTIONARY MEASURES

Given the low shear strength of the upper site soils as well as the fissured/shattered nature of the residual material, all excavations and trenches will have to be suitably battered/shored to ensure safe working conditions.

During periods of high rainfall, the upper site soils can become saturated and lead to problematic underfoot conditions. Having regard for the sloping nature of the site, the potential for soil saturation and softening must be borne in mind when selecting plant during construction.

12. CONCLUSIONS

- The site is underlain by shales of the Malmesbury Group which are mantled by residual and transported soils of variable thickness.
- Building foundation settlement of the order of 10mm is anticipated where founding conventionally.
- Base, subbase, selected subgrade and pipe bedding must all be imported.
- Groundwater levels must be anticipated to deteriorate and rise close to close to ground level during the rainy season.
- Excavation conditions will classify as 'soft excavation' in terms of SANS 1200D for the naturally transported and residual soils with excavation in the more competent rock, classifying as 'intermediate excavation'.
- The site development area will classify as 'S' in terms of the NHBRC residential site class designation.

13. GENERAL

The recommendations and discussions presented in this report are based on the subsurface conditions encountered during the site work at the time of investigation and on the results of the limited field and laboratory testing on samples obtained from the trial holes. There may be, however, conditions pertaining to the site which have not been taken into account due to the frequency of the trial holes. The recommendations and discussions presented in this report should be considered preliminary and presented for guidance purposes only.

It is expected that once terracing of the site has commenced and the proposed buildings have been designed and set out, further inspections of foundation excavations etc. will be undertaken with assistance from the geotechnical engineers and/or soils tests be carried out for approval of subgrade and founding conditions throughout.

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 KANTLEY & TEMPLER CONSULTING ENGINEERS <small>ESTABLISHED 1951</small>	CLIENT ZUTARI IMPACT. ENGINEERED.	PROJECT CLOETESVILLE ERF 7001	TITLE TRIAL HOLE SITE LAYOUT	ENGINEER	DRAWING No.		30/09/2022 08:18:08	Room Hubner
				LC	16706GG-01			
				DRAWN	SHEET	REV		
				RH	1 OF 1 B			
DATE	06/06/2022	SCALE	1:1500	A3				

Appendix A

Trial Hole Profile



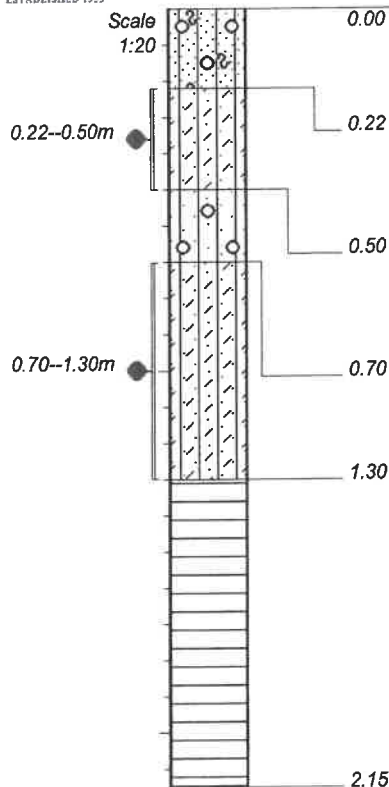
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CONSULTING ENGINEERS

ESTABLISHED 1953

ERF 7001 CLOETESVILLE
ZUTARI

HOLE No: TH1
Sheet 1 of 1

JOB NUMBER: 16706G



Moist light brown locally blotched orange firm to stiff fissured SILT/SAND with occasional grit, fine gravel and scattered fine roots; REWORKED TRANSPORTED.

Moist dark brownish orange mottled dark yellow stiff fissured to shattered sandy clayey SILT with scattered to occasional fine ferruginous grit. REWORKED RESIDUAL/PEDOGENIC.

Moist dark brownish orange mottled dark yellow stiff fissured to shattered sandy SILT with scattered black ferruginous fine gravel and occasional grit; REWORKED RESIDUAL/PEDOGENIC.

Moist dark yellow occasionally blotched orange red and light purple firm to stiff sandy clayey SILT with remnant bedding structure locally; RESIDUAL.

Light purple, dark yellow light grey and orange completely to highly weathered steeply dipping jointed very soft to soft rock SHALE; MALMESBURY GROUP.

Locally completely weathered material is soil-like tending to stiff residual clayey silt.

NOTES

- 1) No groundwater encountered.
- 2) Rock level undulates from 0,75--1,30m.
- 3) Disturbed soil sample extracted from 0,22--0,50m & 0,70--1,30m depth.
- 4) Trial hole terminated 2,15m depth due to difficult excavation in soft rock shale.

CONTRACTOR :
MACHINE :
DRILLED BY :
PROFIED BY: FDP

TYPE SET BY: LL
SETUP FILE: K&T-TR~1.SET

INCLINATION: Vertical

DIAM :
DATE :
DATE: 23-09-2022

DATE: 24/10/2022 13:50
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ELEVATION :
X-COORD : 3752967
Y-COORD : 0013383

HOLE No: TH1

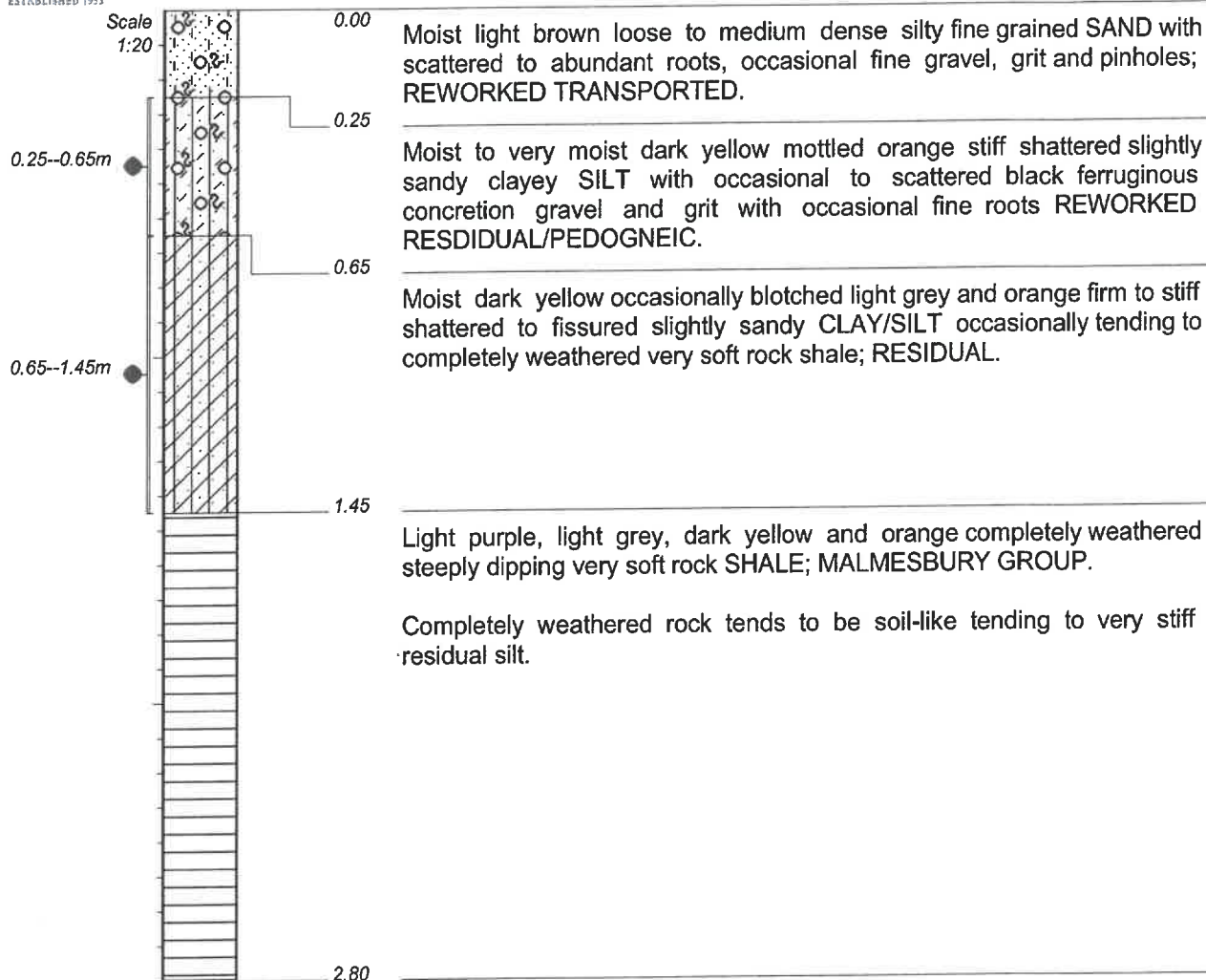


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ESTABLISHED 1953

ERF 7001 CLOETESVILLE
ZUTARI

HOLE No: TH2
Sheet 1 of 1

JOB NUMBER: 16706G



NOTES

- 1) No groundwater encountered.
- 2) Disturbed soil sample extracted from 0,25--0,65m and 0,65--1,45m depth.

CONTRACTOR :
MACHINE :
DRILLED BY :
PROFILED BY : FDP

TYPE SET BY : LL
SETUP FILE : K&T-TR~1.SET

INCLINATION : Vertical
DIAM :
DATE :
DATE : 23-09-2022

DATE : 24/10/2022 13:51
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ELEVATION :
X-COORD : 3753051
Y-COORD : 0013243

HOLE No: TH2



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ERF 7001 CLOETESVILLE
ZUTARI

HOLE No: TH3
Sheet 1 of 1

JOB NUMBER: 16706G

Scale
1:20



0.00

Slightly moist to moist with depth light brownish yellow loose to medium dense slightly silty to silty fine grained SAND with scattered roots and occasional fine ferruginous grit; REWORKED TRANSPORTED.

0.40

Moist to very moist olive yellow blotched yellowish orange firm to stiff slightly sandy clayey clayey SILT with scattered black ferruginous concretions and quartz gravel; REWORKED RESIDUAL/ PEDOGENIC.

0.80

Very moist dark yellow blotched to mottled orange firm to stiff fissured sandy sandy clayey SILT locally tending to completely weathered very soft shale; RESIDUAL.

1.40

Dark yellow, orange red, light purple and light grey completely weathered steeply dipping very soft rock SHALE; MALMESBURY GROUP.

Locally completely weathered rock tends to be soil-like tending to very stiff residual clayey silt.

2.25

NOTES

- 1) No groundwater encountered.
- 2) Trial hole terminated at 225m depth due to difficult excavation in very soft rock shale.

CONTRACTOR :
MACHINE :
DRILLED BY :
PROFIED BY : FDP

TYPE SET BY : LL
SETUP FILE : K&T-TR-1.SET

INCLINATION : Vertical

DIAM :
DATE :
DATE : 23-09-2022

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ELEVATION :
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Y-COORD : 0013455

HOLE No: TH3

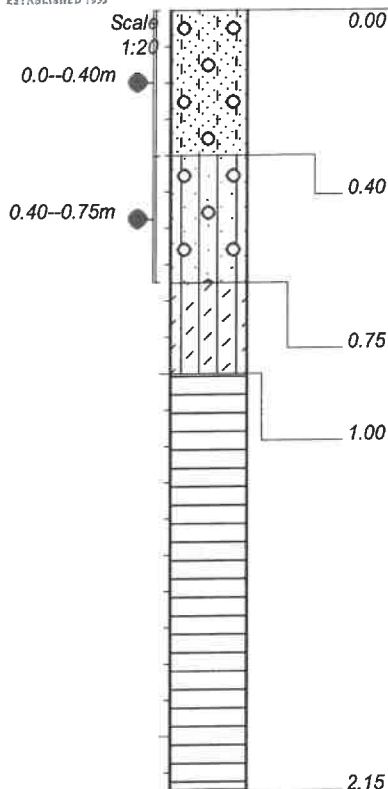


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CONSULTING ENGINEERS
ESTABLISHED 1953

ERF 7001 CLOETESVILLE
ZUTARI

HOLE No: TH4
Sheet 1 of 1

JOB NUMBER: 16706G



Dry to moist with depth light greyish yellow becoming dark yellow loose to medium dense silty fine grained SAND with scattered roots occasional gravel and cobble sized rock fragments; REWORKED TRANSPORTED

Upper zone of horizon weakly cemented into lumps.

Moist to very moist dark yellow blotched orange and brown very stiff fissured sandy clayey SILT with abundant black ferruginous concretions gravel with occasional fine roots; REWORKED RESIDUAL / PEDOGENIC.

Very moist dark yellow blotched light orange very stiff fissured to shattered slightly clayey SILT; RESIDUAL.

Dark yellow orange red and light purple completely weathered steeply dipping very soft rock SHALE; MALMESBURY GROUP.

Completely weathered rock tend to be soil like tending to very stiff residual clayey silt.

NOTES

- 1) No groundwater encountered.
- 2) Disturbed soil sample extracted at 0,0--0,40m and 0,40--0,75m depth.
- 3) Trial hole terminated at 2.15m depth due to difficult excavation in very soft rock shale.

CONTRACTOR :
MACHINE :
DRILLED BY :
PROFILED BY: FDP

TYPE SET BY: LL
SETUP FILE: K&T-TR-1.SET

INCLINATION: Vertical
DIAM :
DATE :
DATE: 23-09-2022

DATE: 24/10/2022 13:51
TEXT : ..etesvilleTHs\G167064.txt

ELEVATION :
X-COORD : 3752969
Y-COORD : 0013471

HOLE No: TH4



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ERF 7001 CLOETESVILLE
ZUTARI

HOLE No: TH5
Sheet 1 of 1

JOB NUMBER: 16706G

Scale
1:20



0.00

Dry light brown medium dense sandy SILT with scattered roots, occasional gravel and grit; REWORKED TRANSPORTED.

Horizon weakly cemented into discontinuities lumps

0.13

Moist brown dark yellow and light orange stiff fissured, locally slightly sandy, clayey SILT; RESIDUAL.

0.30

Light grey, reddish orange, dark yellow and brown completely to highly weathered steeply dipping laminated very soft to occasional soft rock SHALE; MALMESBURY GROUP.

Locally completely weathered material tends to be soil-like tending to very stiff residual clayey silt.

1.60

NOTES

- 1) No groundwater encountered.
- 2) Machine refusal at 1,60m on soft rock shale.
- 3) Rock level undulates from 0,30--0,95m depth.

CONTRACTOR :
MACHINE :
DRILLED BY :
PROFIED BY : FDP

TYPE SET BY : LL
SETUP FILE : K&T-TR-1.SET

INCLINATION : Vertical
DIAM :
DATE :
DATE : 23-09-2022

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ELEVATION :
X-COORD : 3753100
Y-COORD : 0013295

HOLE No: TH5

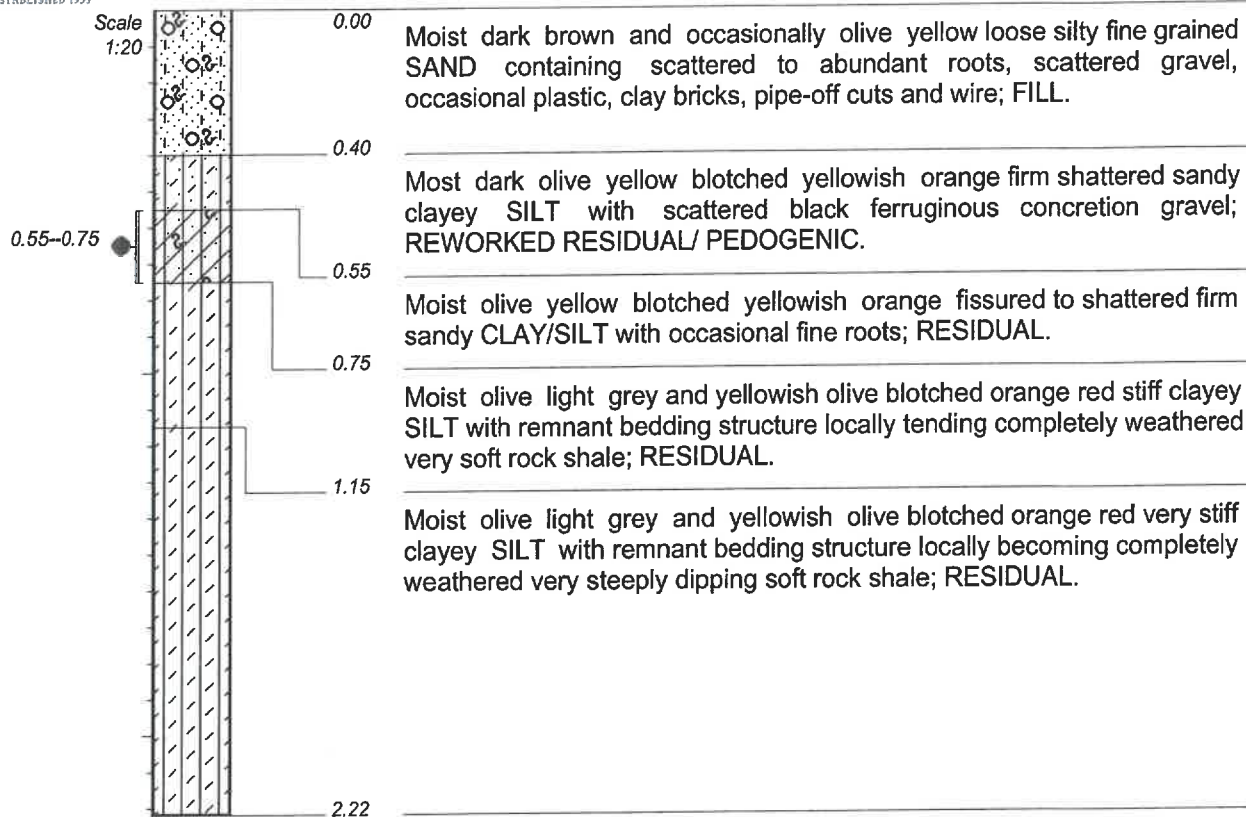


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ERF 7001 CLOETESVILLE
ZUTARI

HOLE No: TH6
Sheet 1 of 1

JOB NUMBER: 16706G



NOTES

- 1) No groundwater encountered.
- 2) Disturbed soil sample 0,55--0,75 md doeth
- 3) Trial hole terminated at 2,20m depth to slow excavation in very soft rock.

CONTRACTOR :
MACHINE :
DRILLED BY :
PROFIED BY: FDP

TYPE SET BY: LL
SETUP FILE: K&T-TR~1.SET

INCLINATION: Vertical
DIAM :
DATE :
DATE: 23-09-2022

DATE: 24/10/2022 13:52
TEXT : ..etesvilleTHs\G167066.txt

ELEVATION :
X-COORD: 3752949
Y-COORD: 0013537

HOLE No: TH6



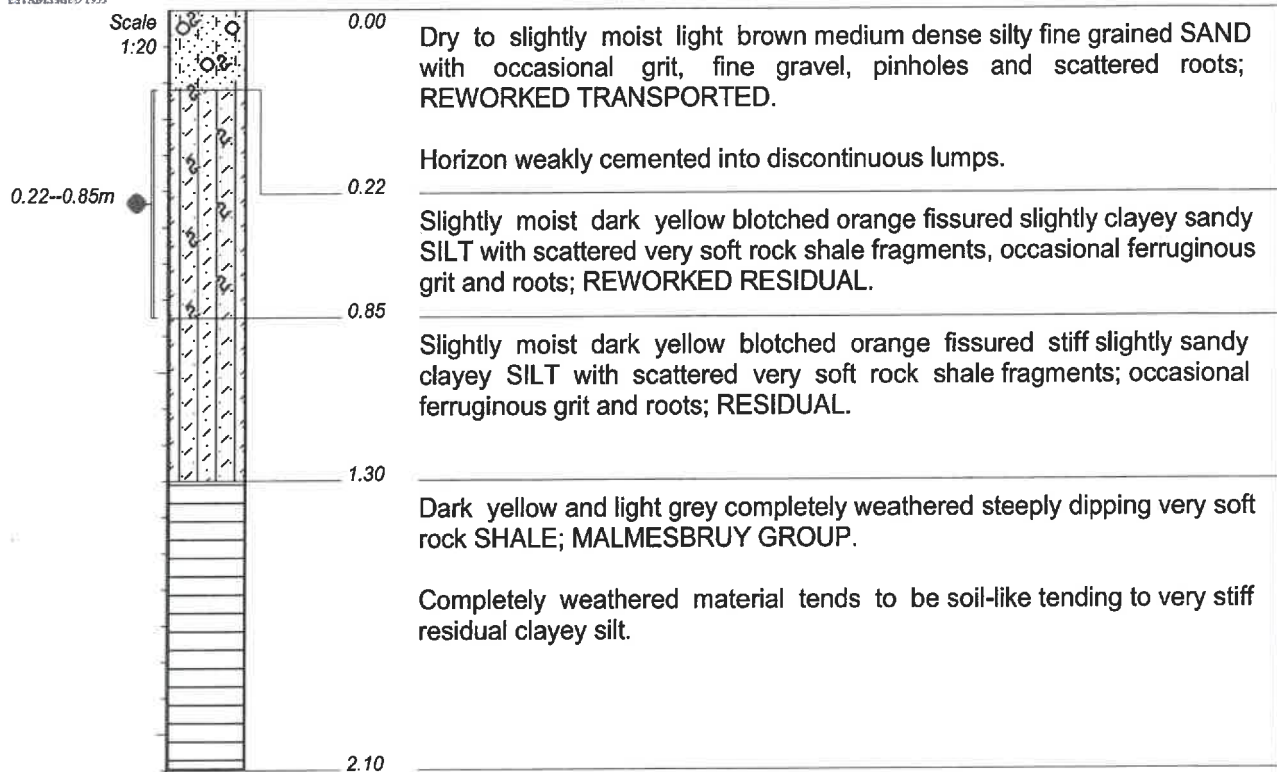
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ESTABLISHED 1953

ERF 7001 CLOETESVILLE
ZUTARI

HOLE No: TH7
Sheet 1 of 1

JOB NUMBER: 16706G



NOTES

- 1) No groundwater encountered.
- 2) Disturbed soil sample excavated from 0,22--0,85m depth.
- 3) Trial hole terminated at 2,10m depth due to difficult excavation in very soft rock shale.

CONTRACTOR :
MACHINE :
DRILLED BY :
PROFILED BY : FDP

TYPE SET BY : LL
SETUP FILE : K&T-TR-1.SET

INCLINATION : Vertical

DIAM :
DATE :
DATE : 23-09-2022

DATE : 24/10/2022 13:52
TEXT : ..etesvilleTHs\G167067.txt

ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TH7

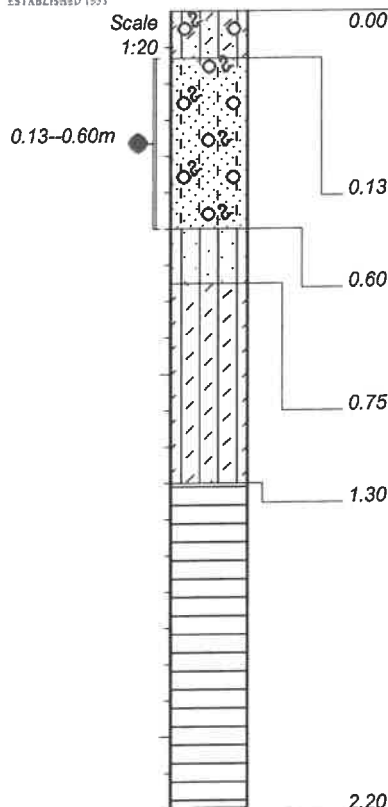


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CONSULTING ENGINEERS
ESTABLISHED 1953

ERF 7001 CLOETESVILLE
ZUTARI

HOLE No: TH8
Sheet 1 of 1

JOB NUMBER: 16706G



Slightly moist dark yellow mottled light olive yellow and reddish orange firm slightly sandy clayey SILT with occasional pockets of crushed gravel fine roots; FILL.

Horizon weakly cemented into discontinuous lumps.

Moist to very moist light brown medium dense silty fine grained SAND with occasional fine gravel and roots; TRANSPORTED.

Very moist light brownish orange mottled light yellow stiff sandy SILT with abundant ferruginous concretion and quartz gravel; REWORKED RESIDUAL/PEDOGENIC

Moist dark yellow mottled brownish orange and orange red stiff fissured slightly clayey SILT, RESIDUAL.

Light grey, reddish orange, dark yellow and brown completely to highly weathered steeply dipping laminated very soft to occasional soft rock SHALE; MALMESBURY GROUP.

Locally completely weathered rock tends to be soil-like tending to very stiff residual clayey silt.

NOTES

- 1) No groundwater encountered.
- 2) Disturbed soil sample extracted from 0,13--0,60m depth.
- 3) Trial hole terminated at 2,20m depth due to difficult excavation in very soft rock shale.

CONTRACTOR:
MACHINE:
DRILLED BY:
PROFIED BY: FDP

TYPE SET BY: LL
SETUP FILE: K&T-TR-1.SET

INCLINATION: Vertical

DIAM:
DATE:
DATE: 23-09-2022

DATE: 24/10/2022 13:52
TEXT: ..etesvilleTHs\G167068.txt

ELEVATION:
X-COORD: 3753157
Y-COORD: 0013343

HOLE No: TH8

Appendix B

Laboratory Test Results



STEYN-WILSON
LABORATORIES

CIVIL ENGINEERING TESTING LABORATORIES



11 Gooderson Road Blackheath

PO Box 58 Blackheath 7581

Tel: 021 905 0435

Fax: 086 499 9482

Email: info@steynwilson.co.za

Web: www.steynwilson.co.za

JOB No: SWL19488

Ref. No: -

Date Tested:

22/09/22

Client: Kantey & Templer (Pty) Ltd
P.O. Box 3132
Cape Town
8000

Attention: Mr L Celliers



DYNAMIC CONE PENETROMETER TMH6 ST6

Project: ERF 7001 - Cloeteville

Level:

NGL

DCP No.: TH 1

Foundation:

N/A

Position: TH 1

Max. penetration depth:

1.910m

Test Depth: 2M

Refusal:

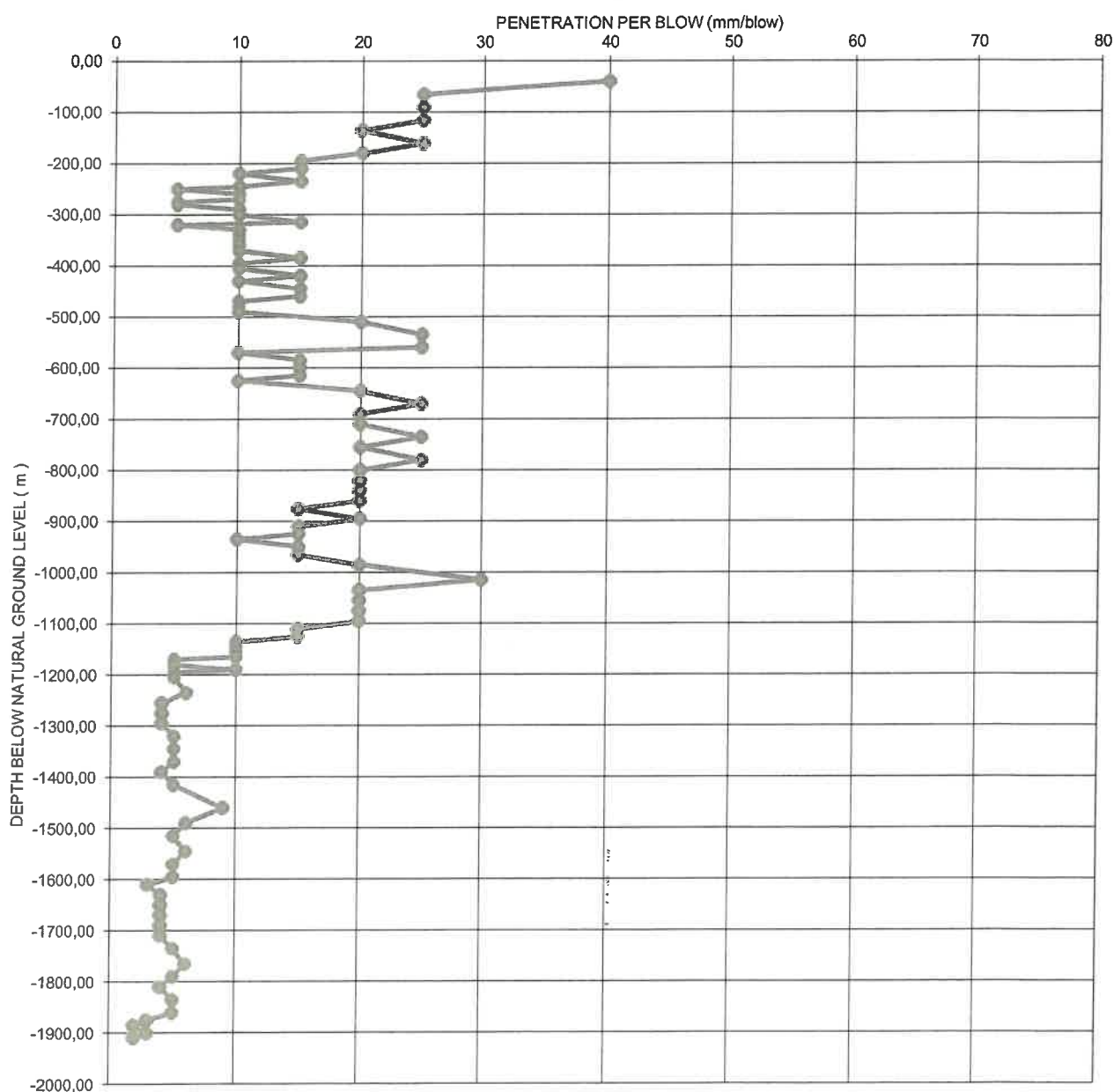
-

Instrument (DCP) Set No: BT2 - 0016

Number of blows per test

1 & 5

PENETRATION GRAPH



NOTE: All tests marked with (*) means that those test methods are not accredited.



STEYN-WILSON
LABORATORIES

CIVIL ENGINEERING TESTING LABORATORIES



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Email: info@steynwilson.co.za

Web: www.steynwilson.co.za

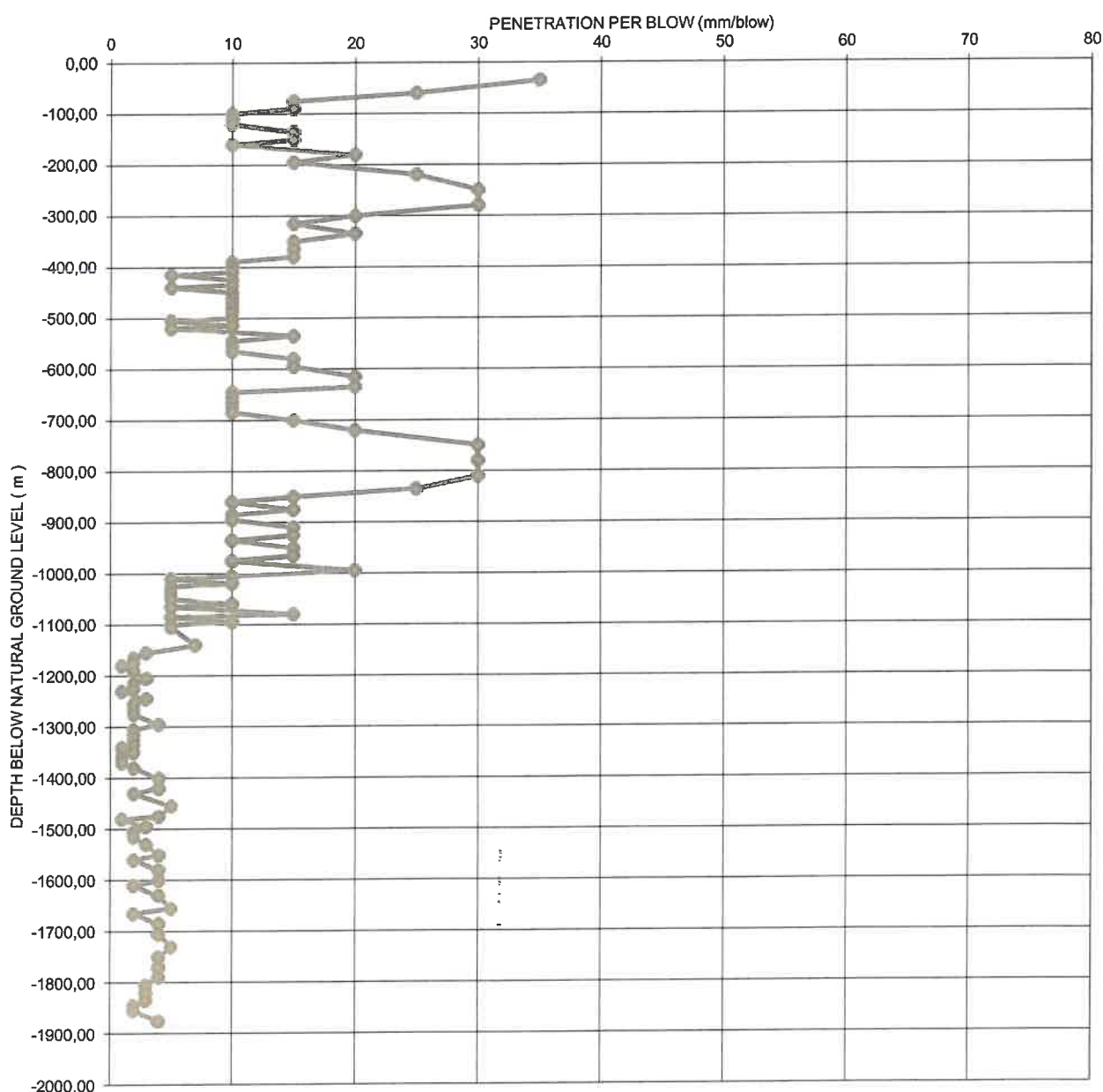
JOB No:	SWL19488	Ref. No:	-	Date Tested:	22/09/22
Client	Kantey & Templer (Pty) Ltd P.O. Box 3132 Cape Town 8000				
Attention:	Mr L Celliers				



DYNAMIC CONE PENETROMETER TMH6 ST6

Project:	ERF 7001 - Cloetesville	Level:	NGL
DCP No.:	TH 2	Foundation:	N/A
Position:	TH 2	Max. penetration depth:	1.875m
Test Depth:	2M	Refusal:	-
Instrument (DCP) Set No:	BT2 - 0016	Number of blows per test	1 & 5

PENETRATION GRAPH



NOTE: All tests marked with (*) means that those test methods are not accredited.



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Fax: 086 499 9482

Email: info@steynwilson.co.za

Web: www.steynwilson.co.za

JOB No: SWL19488 **Ref. No:** - **Date Tested:** 22/09/22

Client: Kantey & Templer (Pty) Ltd
P.O. Box 3132
Cape Town
8000

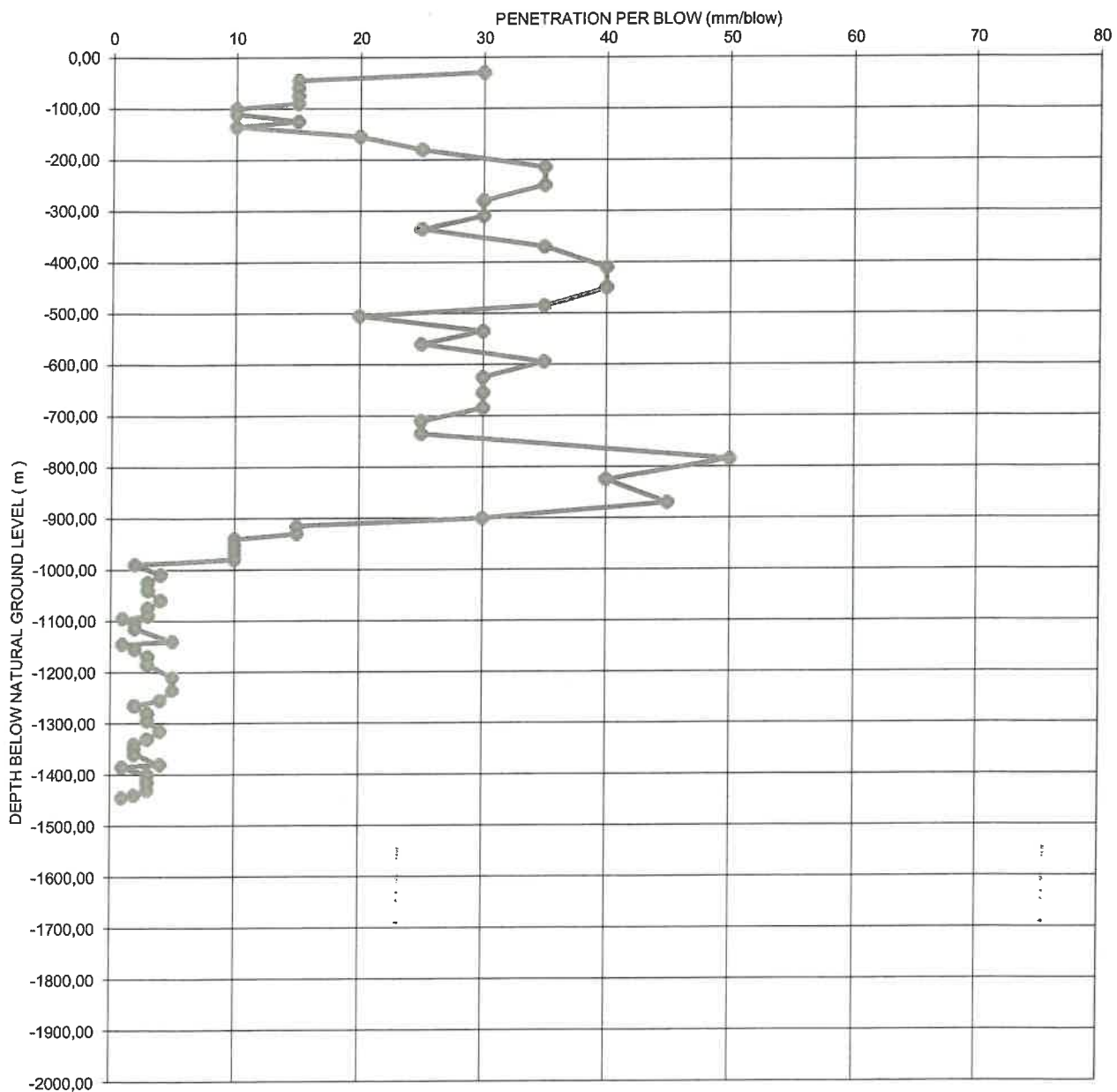
Attention: Mr L Celliers



DYNAMIC CONE PENETROMETER TMH6 ST6

Project:	ERF 7001 - Cloetessville	Level:	NGL
DCP No.:	TH 3	Foundation:	N/A
Position:	TH 3	Max. penetration depth:	1.445m
Test Depth:	2M	Refusal:	1.445m
Instrument (DCP) Set No:	BT2 - 0016	Number of blows per test	1 & 5

PENETRATION GRAPH



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JOB No: SWL19488

Ref. No: -

Date Tested: 22/09/22

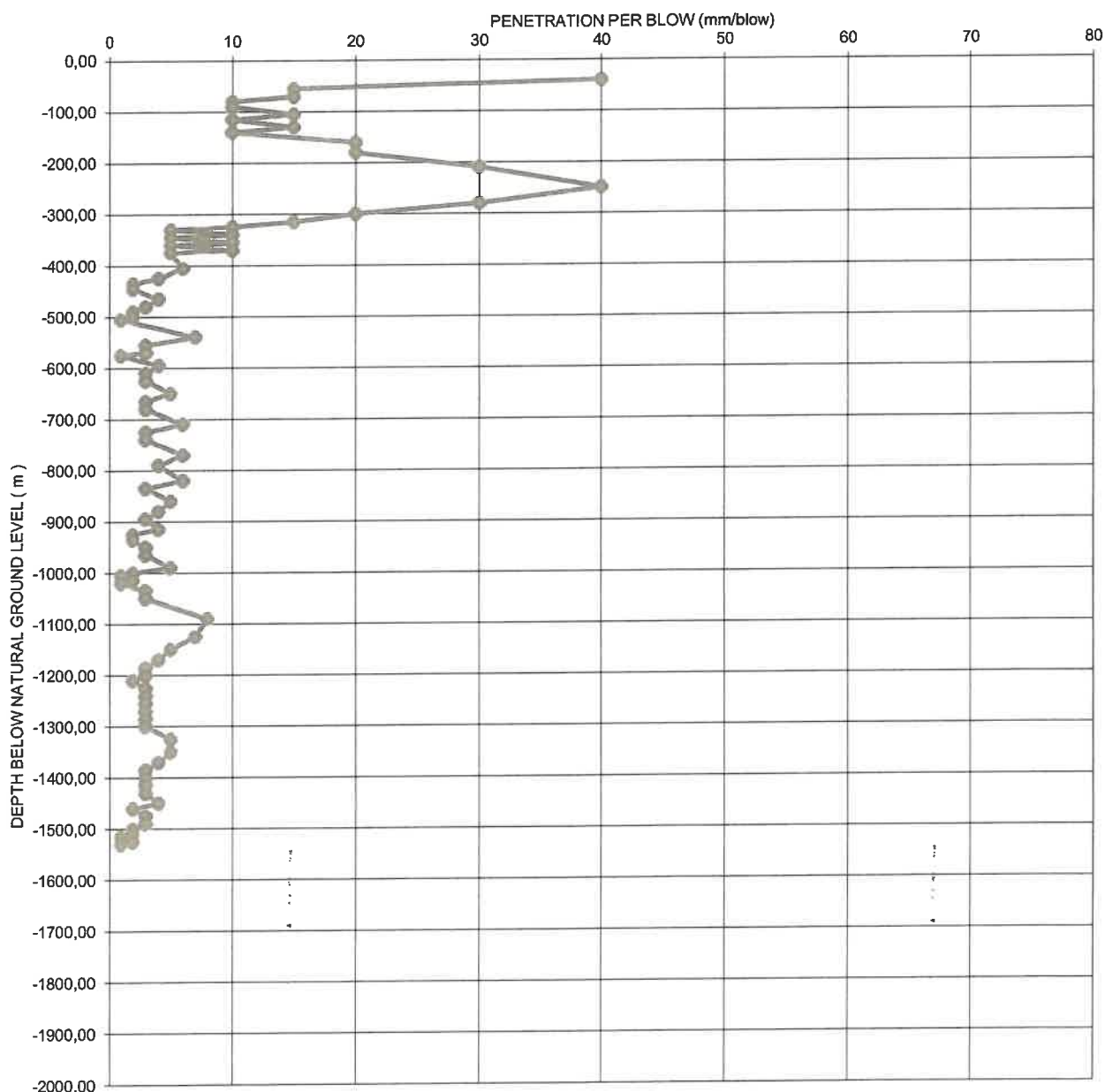
Client: Kantey & Templer (Pty) Ltd
P.O. Box 3132
Cape Town
8000

Attention: Mr L Celliers

DYNAMIC CONE PENETROMETER TMH6 ST6

Project:	ERF 7001 - Cloetesville	Level:	NGL
DCP No.:	TH 4	Foundation:	N/A
Position:	TH 4	Max. penetration depth:	1.530m
Test Depth:	2M	Refusal:	1.530m
Instrument (DCP) Set No:	BT2 - 0016	Number of blows per test	1 & 5

PENETRATION GRAPH



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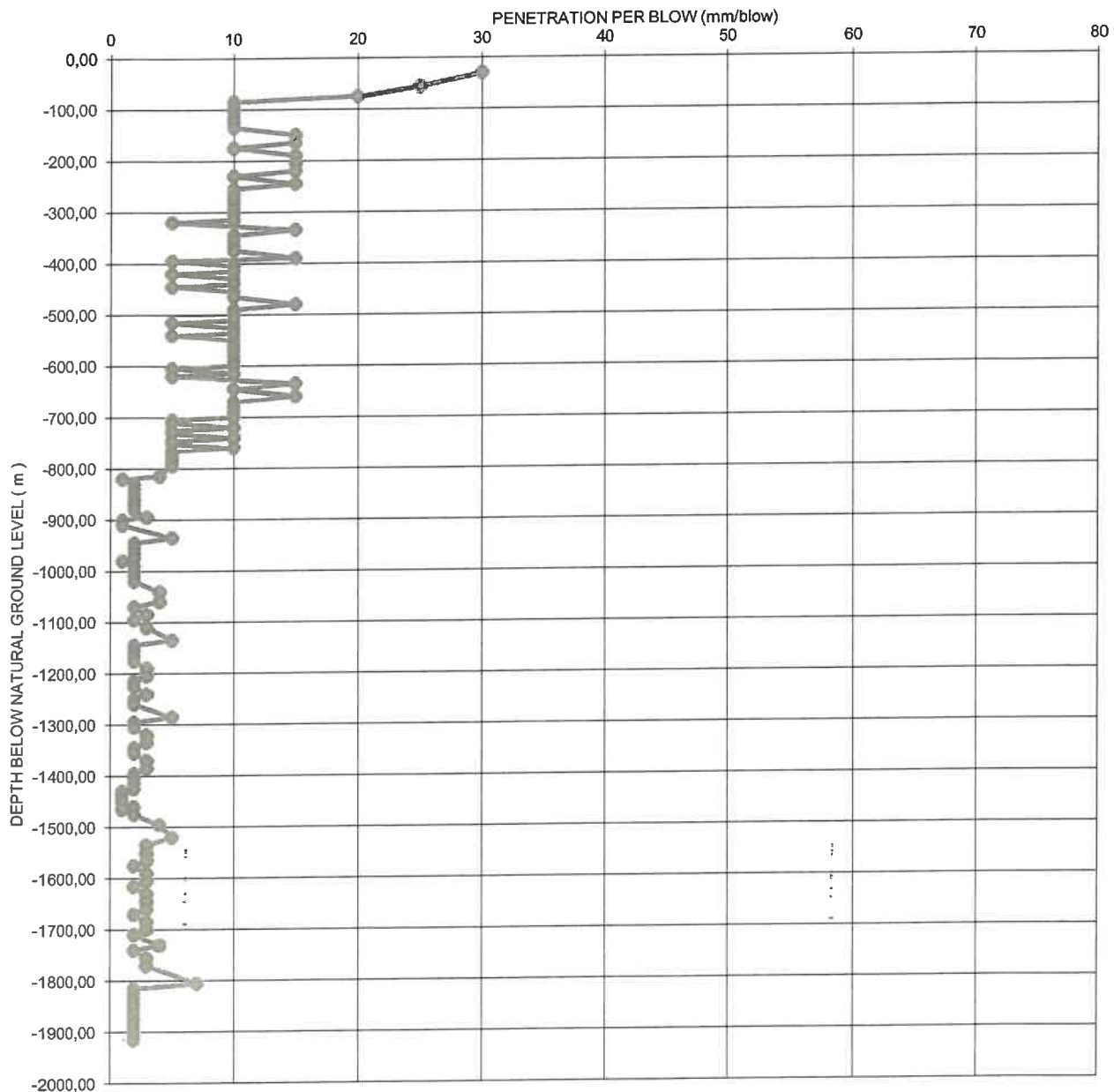
JOB No:	SWL19488	Ref. No:	-	Date Tested:	22/09/22
Client	Kantey & Templer (Pty) Ltd P.O. Box 3132 Cape Town 8000				
Attention:	Mr L Celliers				



DYNAMIC CONE PENETROMETER TMH6 ST6

Project:	ERF 7001 - Cloeteville	Level:	NGL
DCP No.:	TH 5	Foundation:	N/A
Position:	TH 5	Max. penetration depth:	1.915m
Test Depth:	2M	Refusal:	-
Instrument (DCP) Set No:	BT2 - 0016	Number of blows per test	1 & 5

PENETRATION GRAPH



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JOB No: SWL19488
Client: Kantey & Templer (Pty) Ltd
P.O. Box 3132
Cape Town
8000
Attention: Mr L Celliers

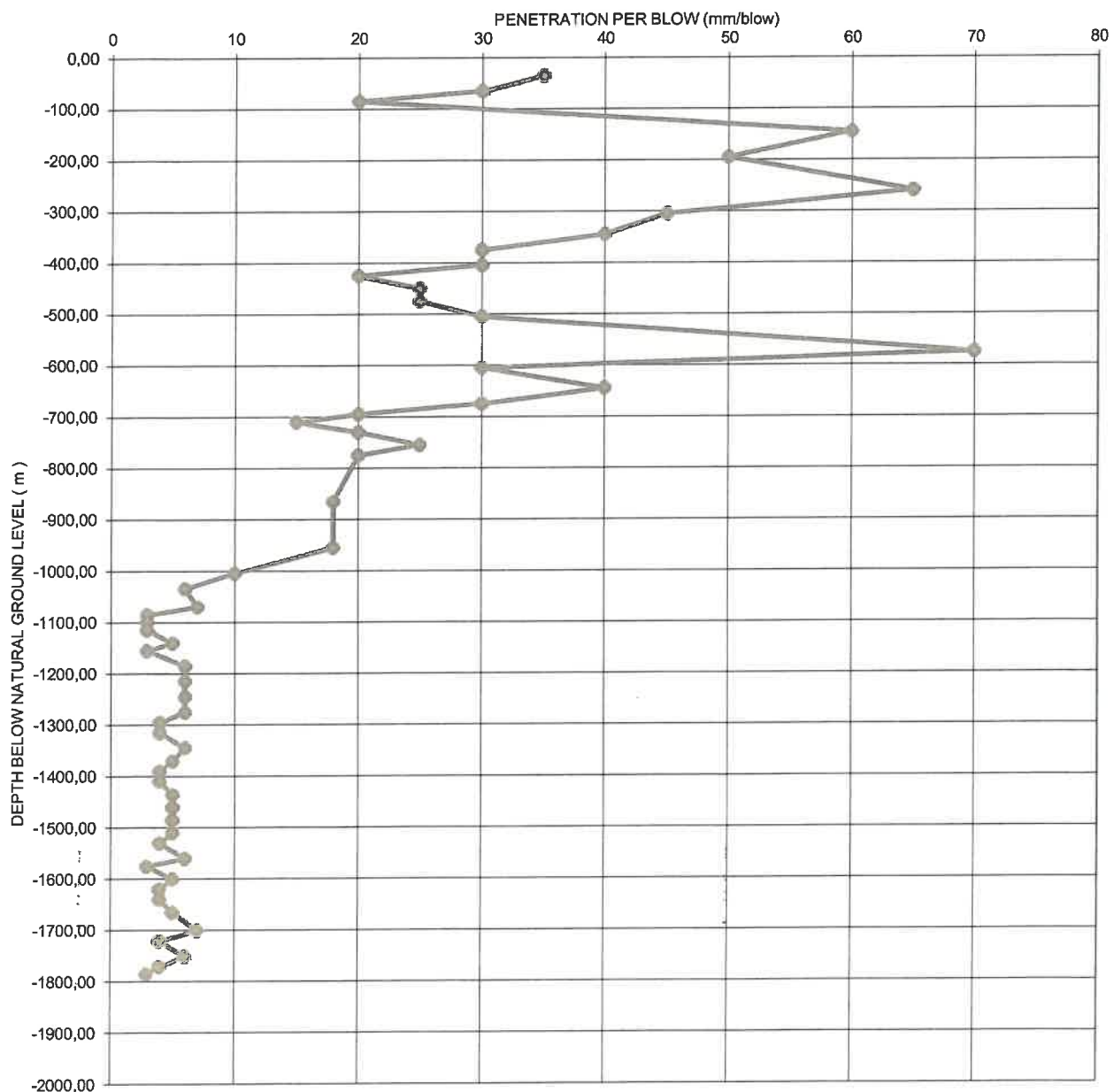
Ref. No: -

Date Tested: 22/09/22

DYNAMIC CONE PENETROMETER TMH6 ST6

Project:	ERF 7001 - Cloetesville	Level:	NGL
DCP No.:	TH 6	Foundation:	N/A
Position:	TH 6	Max. penetration depth:	1.785m
Test Depth:	2M	Refusal:	-
Instrument (DCP) Set No:	BT2 - 0016	Number of blows per test	1 & 5

PENETRATION GRAPH



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Web: www.steynwilson.co.za

JOB No: SWL19488

Ref. No: -

Date Tested:

22/09/22

Client Kantey & Templer (Pty) Ltd
P.O. Box 3132
Cape Town
8000

Attention: Mr L Celliers



DYNAMIC CONE PENETROMETER TMH6 ST6

Project: ERF 7001 - Cloeteville

Level:

NGL

DCP No.: TH 7

Foundation:

N/A

Position: TH 7

Max. penetration depth:

1.015m

Test Depth: 2M

Refusal:

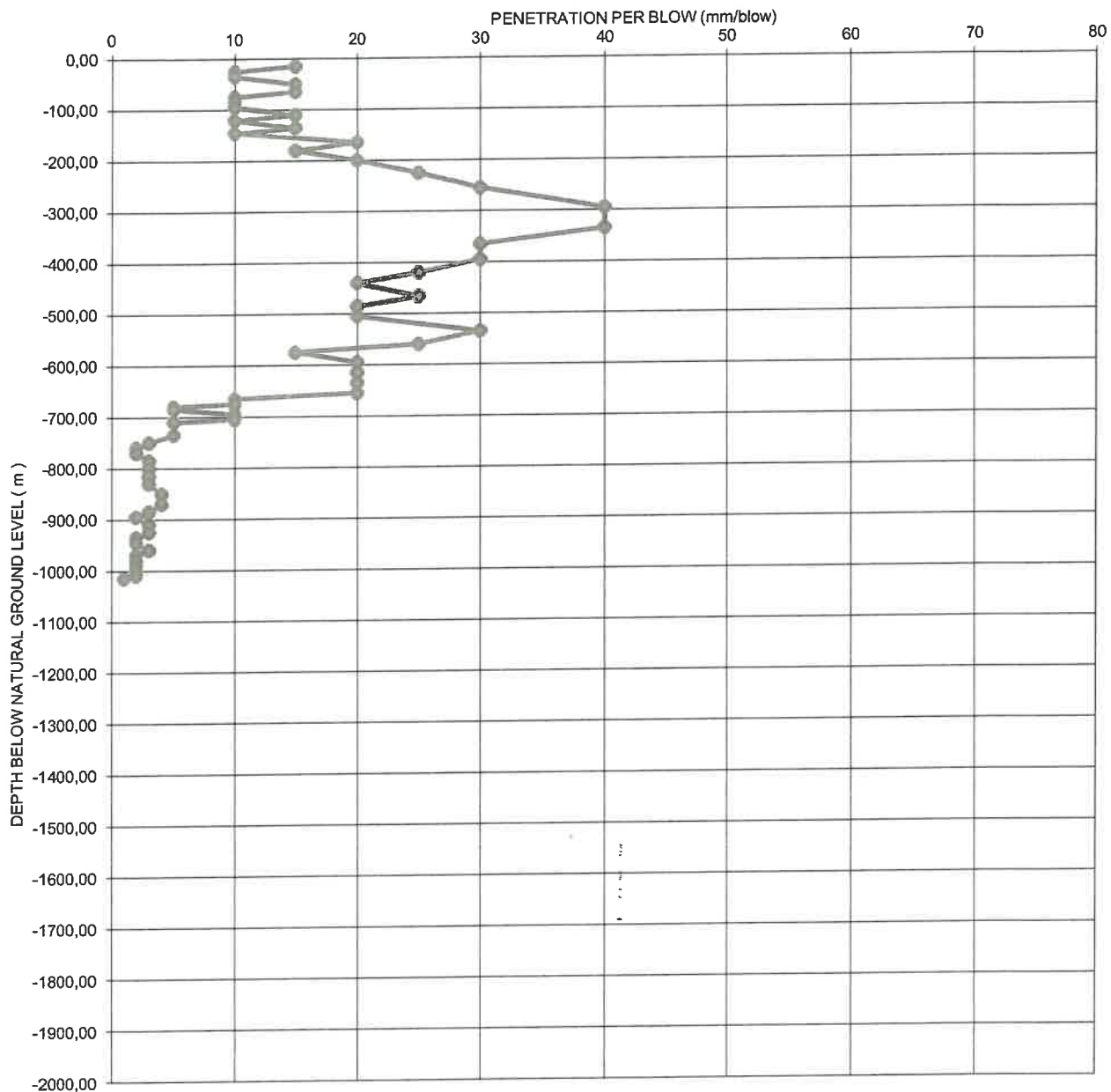
1.015m

Instrument (DCP) Set No: BT2 - 0016

Number of blows per test

1 & 5

PENETRATION GRAPH



NOTE: All tests marked with (*) means that those test methods are not accredited.



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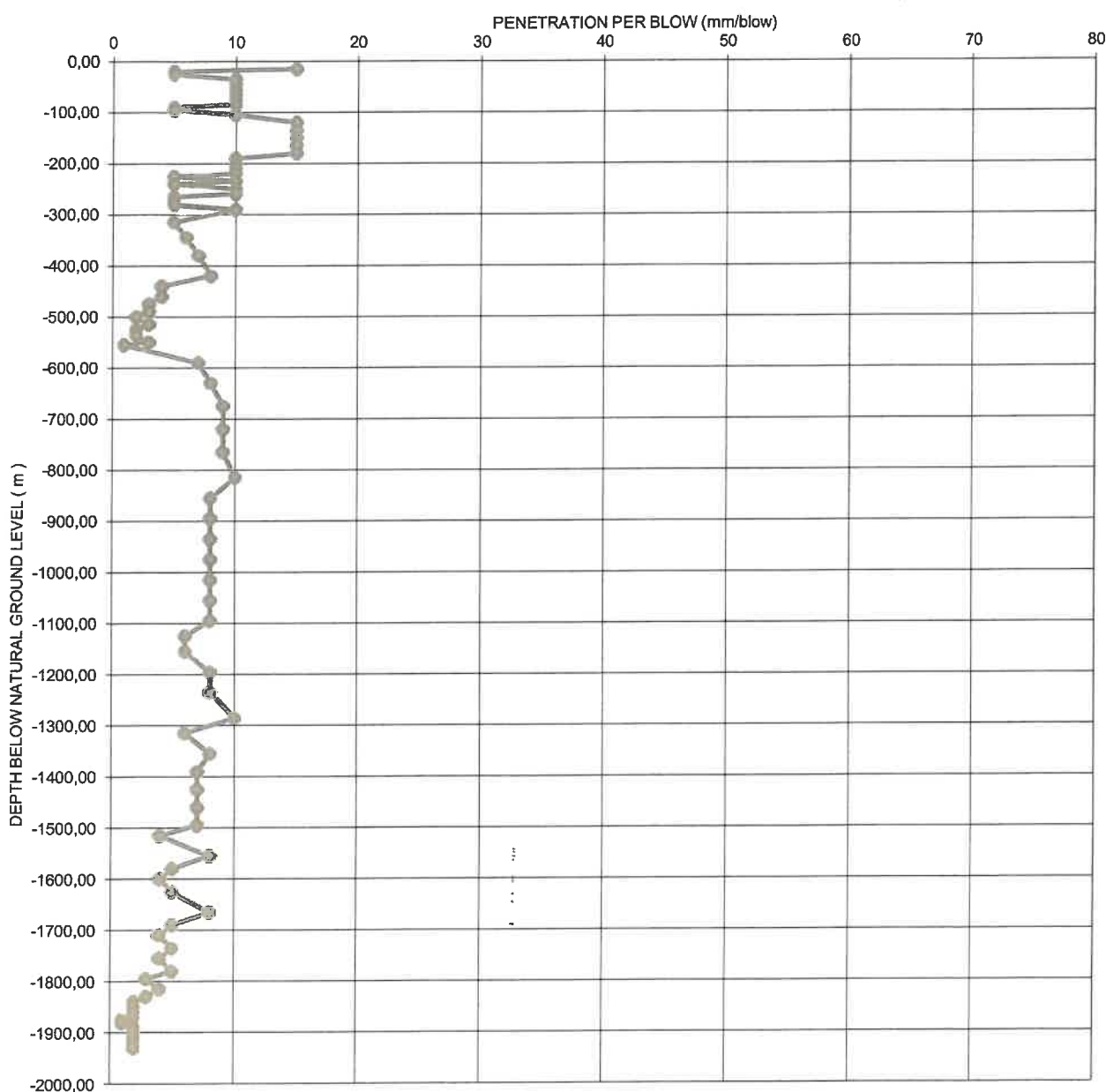
JOB No:	SWL19488	Ref. No:	-	Date Tested:	22/09/22
Client	Kantey & Timpler (Pty) Ltd P.O. Box 3132 Cape Town 8000				
Attention:	Mr L Celliers				



DYNAMIC CONE PENETROMETER TMH6 ST6

Project:	ERF 7001 - Cloetesville	Level:	NGL
DCP No.:	TH 8	Foundation:	N/A
Position:	TH 8	Max. penetration depth:	1.930m
Test Depth:	2M	Refusal:	-
Instrument (DCP) Set No:	BT2 - 0016	Number of blows per test	1 & 5

PENETRATION GRAPH



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Client: **Kantey & Templer (Pty) Ltd**

Project: **ERF 7001 - Cloetessville**

Attention: **Mr L Celliers**

Your Ref. No: **-**

Date Reported **29/09/22**

TEST REPORT REFERENCE NUMBER / JOB NUMBER :

SWL19488

Dear Sir / Madam

Herewith please find the original reports pertaining to the above mentioned project.

Test Requested

Site Sampling and Materials Information

4x **FOUNDATION INDICATOR**

Sampling Method **TMH5 MA2**

Environmental Condition **Rainy**

FINAL REPORT

We would like to take this opportunity to thank you for your valued support.
Should you have any further enquiries please don't hesitate to contact me.

Yours Faithfully

STEYN-WILSON LABORATORIES (PTY) LTD

Remarks:

1. Information contained herein is confidential to STEYN-WILSON PTY LTD and the addressee
2. Opinions & Interpretations are not included in our schedule of Accreditation.
3. The samples were subjected and analysed according to ASTM.
4. The results reported relate only to the sample tested, Further use of the attached information is not the responsibility or liability of STEYN-WILSON LABORATORIES (PTY) LTD.
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6. Measuring equipment is traceable to national standards (Where applicable).
7. Should there be any deviation from the prescribed test method comments will be made thereof, pertaining to the test on the relevant materials report.

Mr. R. Wilson
Technical Signatory

DIRECTORS: **Mr. J. Steyn ND-Civil (Managing) | Mr. R. Wilson B-Tech Civil (Operations)**

FINANCIAL MANAGER: **Mr. D. Erasmus (SAICA Reg No: 200522562)**

LABORATORY MANAGER: **Mr. K. Booysen**



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Customer : **Kantey & Templer (Pty) Ltd**

P.O. Box 3132

Cape Town

8000

Attention : Mr L Celliers

Project : ERF 7001 - Cloeteville

Date Received : 22/09/22

Date Reported : 29/09/22

Req. Number : -

FOUNDATION INDICATOR ASTM D422

Material Description:	Silty SAND	Sample Number:	21895		
Position:	TH 6	Liquid Limit	29,3	Linear Shrinkage	4,9
Depth:	0.55 - 0.75m	Plasticity Index	10,2	Insitu M/C%	13,3

PH (TMH1 A20)* 8

(TMH1 A21T)*
Conductivity
s.m⁻¹ 0,014

SG (TMH1 A12T)* 2,66

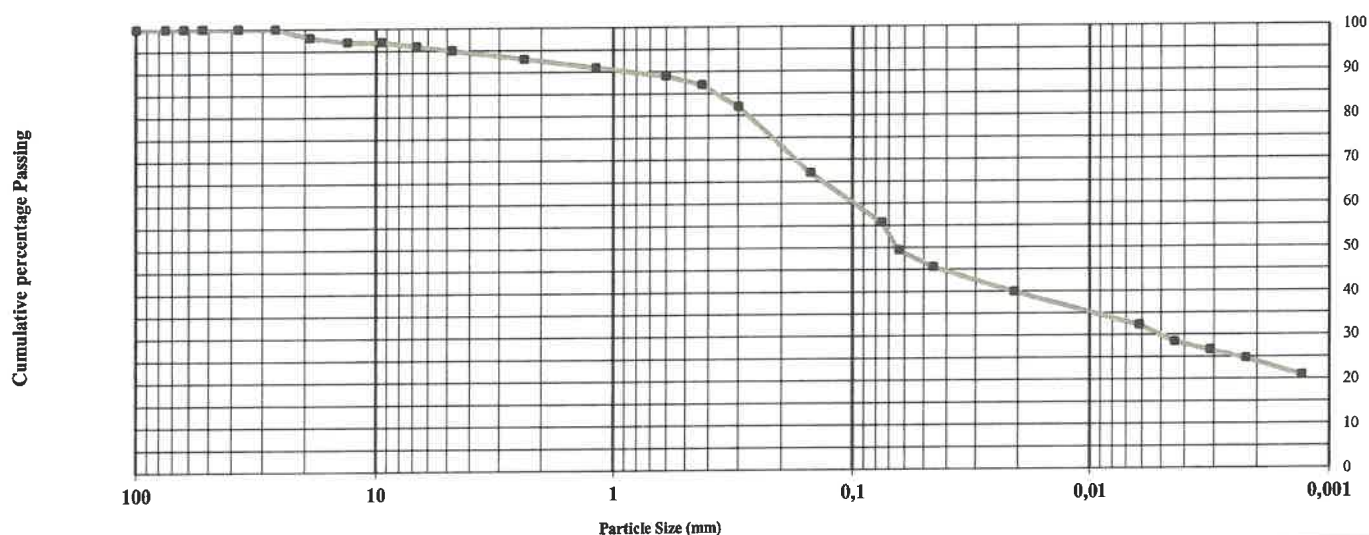
SIEVE ANALYSIS (TMH 1 A1a)*

HYDROMETER ASTM D422

100	75	63	53	37,5	26,5	19,0	13,2	9,5	6,7	4,75	2,36	1,18	0,60	0,425	0,300	0,150	0,075	0,063	0,048	0,021	0,006	0,004	0,003	0,002	0,001
100	100	100	100	100	100	98	97	97	96	95	93	91	89	87	82	67	55,7	49,4	45,6	39,9	32,3	28,5	26,6	24,7	20,9

% Passing

Particle Size Distribution



% Gravel

8

% Sand

43

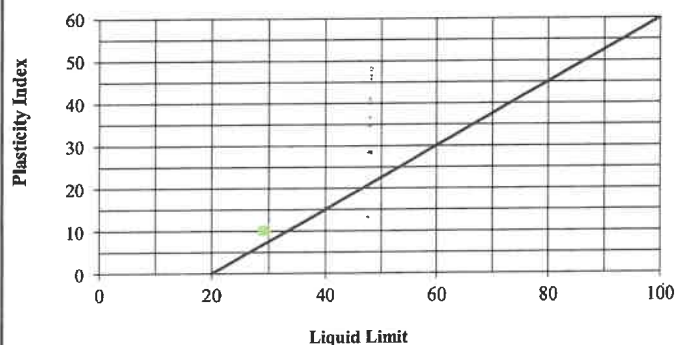
% Silt

25

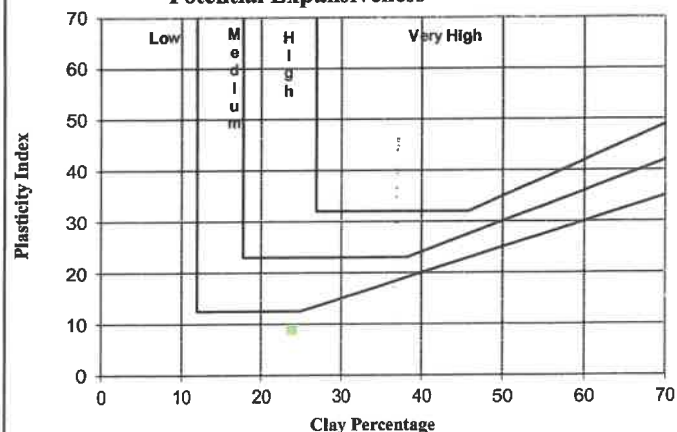
% Clay

24

Plasticity Chart A Line



Potential Expansiveness



NOTE: All tests marked with (*) means that those test methods are not accredited.

Customer : **Kantey & Templer (Pty) Ltd**
P.O. Box 3132
Cape Town
8000
Attention : Mr L Celliers

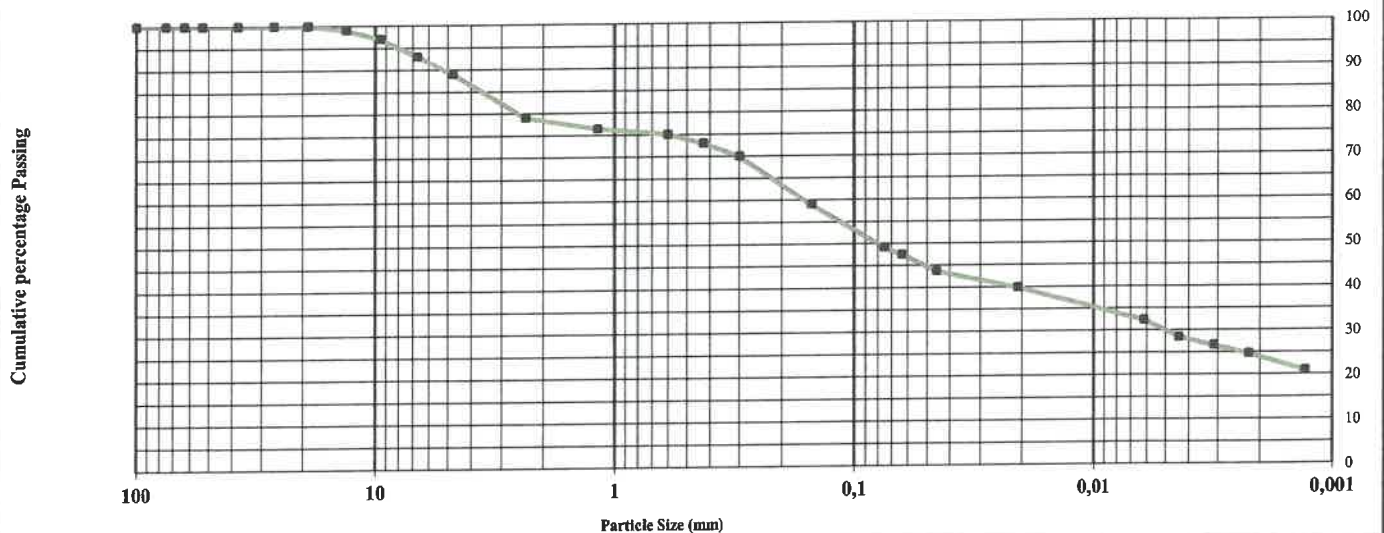
Project : ERF 7001 - Cloeteville
Date Received : 22/09/22
Date Reported : 29/09/22
Req. Number : -

FOUNDATION INDICATOR ASTM D422

Material Description:	Silty SAND	Sample Number:	21896		
Position:	TH 2	Liquid Limit	28,5	Linear Shrinkage	4,8
Depth:	0.65 - 1.45m	Plasticity Index	9,7	Insitu M/C%	11,4
PH (TMH1 A20)*		5,4	(TMH1 A21T)* Conductivity s.m ⁻¹		0,006
			SG (TMH1 A12T)*		2,632

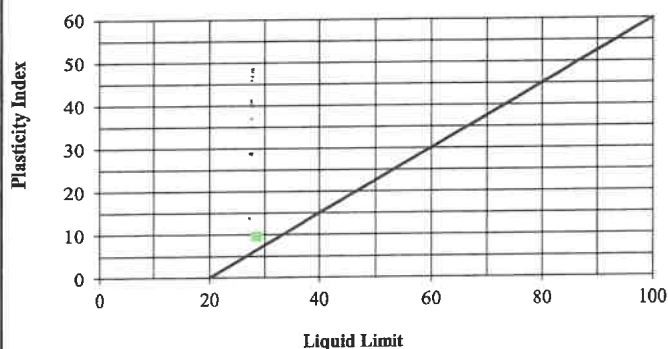
SIEVE ANALYSIS (TMH 1 A1a)*																	HYDROMETER ASTM D422								
100	75	63	53	37,5	26,5	19,0	13,2	9,5	6,7	4,75	2,36	1,18	0,60	0,425	0,300	0,150	0,075	0,063	0,046	0,021	0,006	0,004	0,003	0,002	0,001
100	100	100	100	100	100	100	99	97	93	89	79	76,4	75	73	70	59	49,1	47,5	43,7	39,9	32,3	28,5	26,6	24,7	20,9
% Passing																									

Particle Size Distribution

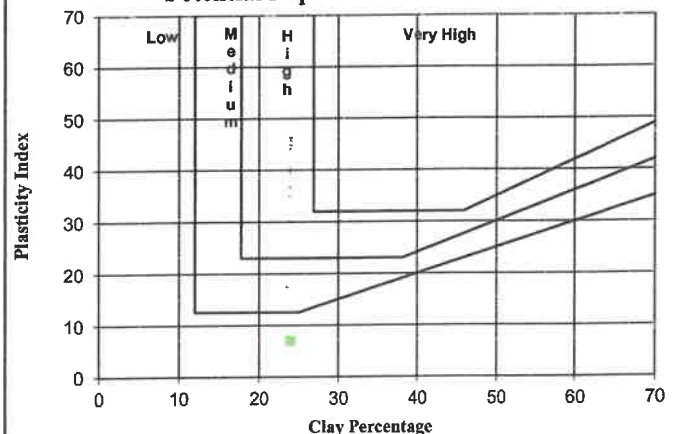


% Gravel	22	% Sand	31	% Silt	23	% Clay	24
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Plasticity Chart A Line



Potential Expansiveness



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Web: www.steynwilson.co.za

Customer : **Kantey & Templer (Pty) Ltd**

P.O. Box 3132

Cape Town

8000

Attention : Mr L Celliers

Project : ERF 7001 - Cloetessville

Date Received : 22/09/22

Date Reported : 29/09/22

Req. Number : -

FOUNDATION INDICATOR ASTM D422

Material Description:	Silty SAND	Sample Number:	21897		
Position:	TH 1	Liquid Limit	23	Linear Shrinkage	3,9
Depth:	0.22 - 0.5m	Plasticity Index	7,9	Insitu M/C%	11,3

PH (TMH1 A20)*

(TMH1 A21T)*
Conductivity
s.m⁻¹

SG (TMH1 A12T)*

2,632

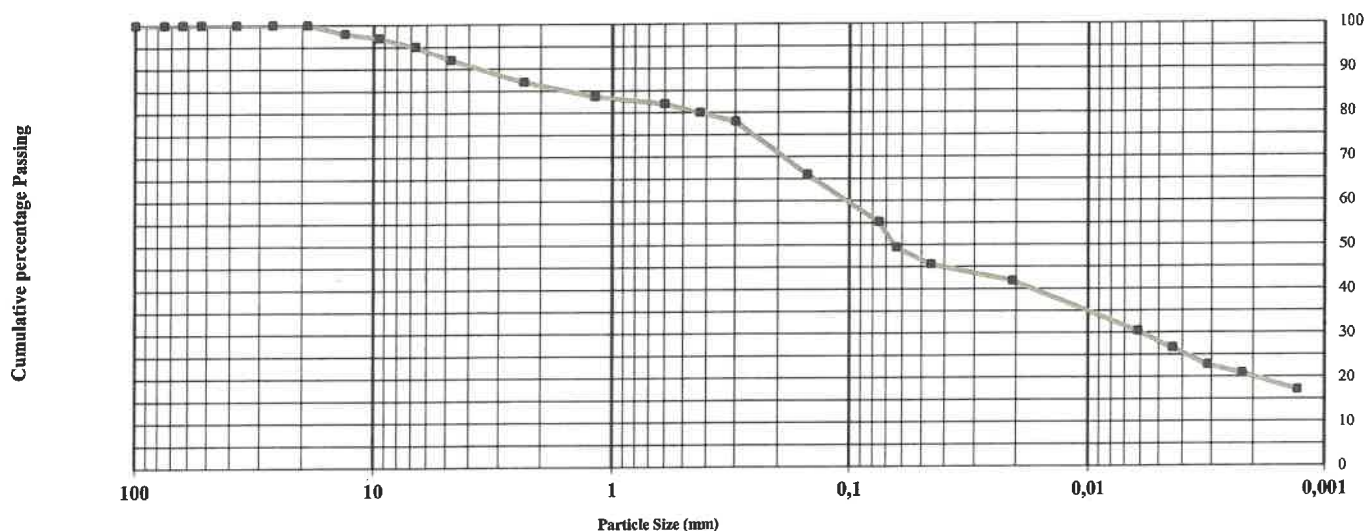
SIEVE ANALYSIS (TMH 1 A1a)*

100	75	63	53	37,5	26,5	19,0	13,2	9,5	6,7	4,75	2,36	1,18	0,60	0,425	0,300	0,150	0,075	0,063	0,046	0,021	0,006	0,004	0,003	0,002	0,001
100	100	100	100	100	100	100	98	97	95	92	87	83,7	82	80	78	66	55,2	49,4	45,6	41,8	30,4	26,6	22,8	20,9	17,1

% Passing

HYDROMETER ASTM D422

Particle Size Distribution



% Gravel

14

% Sand

37

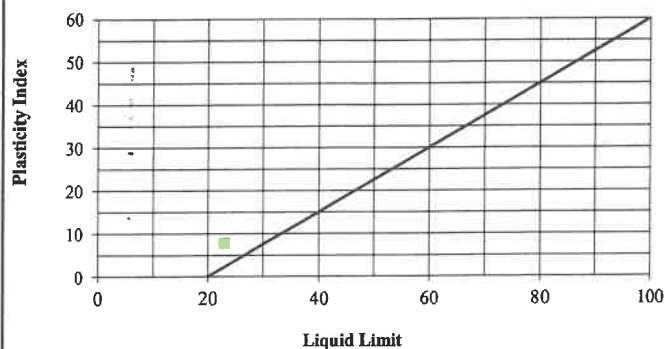
% Silt

29

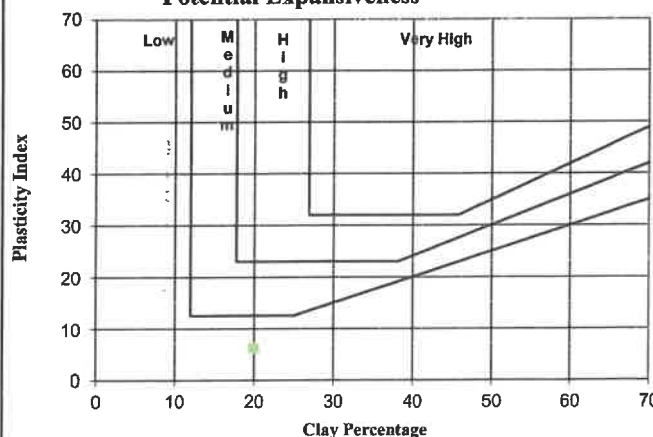
% Clay

20

Plasticity Chart A Line



Potential Expansiveness



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Customer : Kantey & Templer (Pty) Ltd

P.O. Box 3132

Cape Town

8000

Attention : Mr L Celliers

Project : ERF 7001 - Cloetessville

Date Received : 22/09/22

Date Reported : 29/09/22

Req. Number : -

FOUNDATION INDICATOR ASTM D422

Material Description:	Silty SAND	Sample Number:	21898		
Position:	TH 1	Liquid Limit	31	Linear Shrinkage	5,1
Depth:	0.75 - 1.30m	Plasticity Index	11,1	Insitu M/C%	13,8

PH (TMH1 A20)*

5,2

(TMH1 A21T)*
Conductivity
s.m⁻¹

0,008

SG (TMH1 A12T)*

2,632

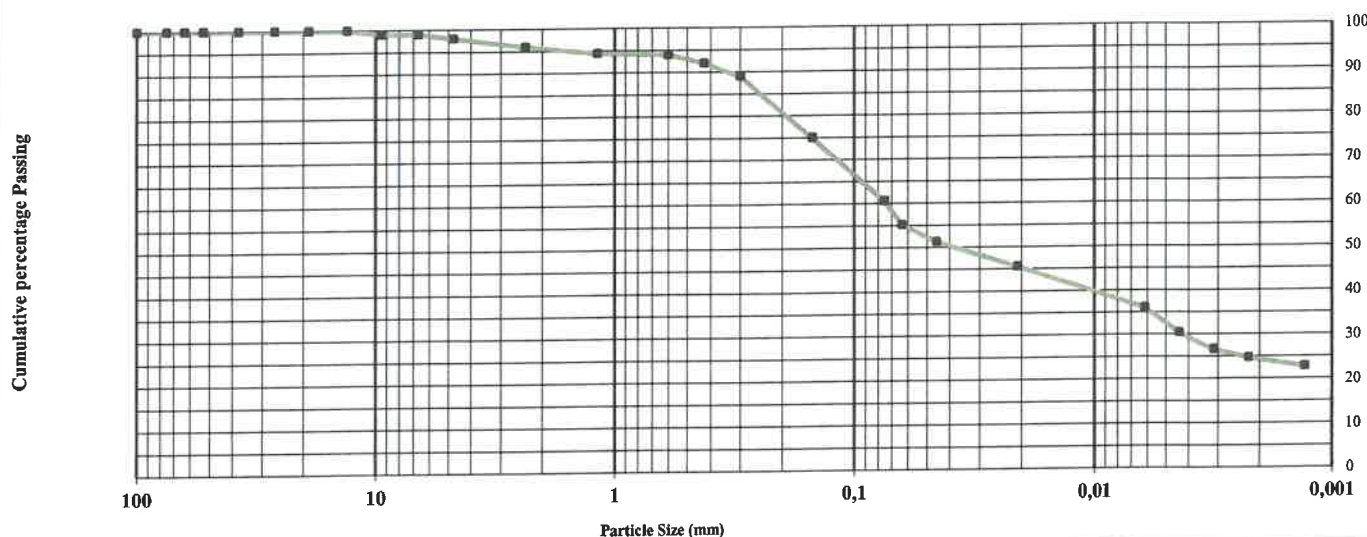
SIEVE ANALYSIS (TMH 1 A1a)*

HYDROMETER ASTM D422

100	75	63	53	37.5	26.5	19.0	13.2	9.5	6.7	4.75	2.36	1.18	0.60	0.425	0.300	0.150	0.075	0.063	0.046	0.021	0.006	0.004	0.003	0.002	0.001
100	100	100	100	100	100	100	100	99	99	98	96	94,4	94	92	89	75	60,6	55,1	51,3	45,6	36,1	30,4	26,6	24,7	22,8

% Passing

Particle Size Distribution



% Gravel

4

% Sand

41

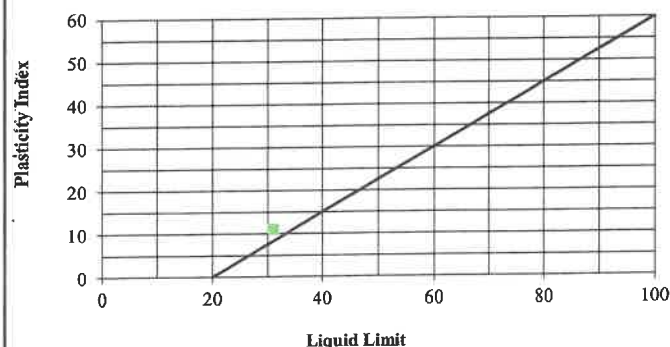
% Silt

31

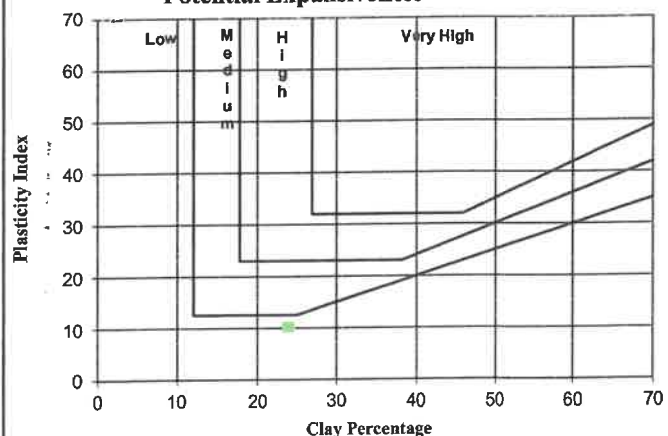
% Clay

24

Plasticity Chart A Line



Potential Expansiveness



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Web: www.steynwilson.co.za

Client: **Kantey & Templer (Pty) Ltd**

Project: **ERF 7001 - Cloeteville**

Attention: **Mr L Celliers**

Your Ref. No: **-**

Date Reported **29/09/22**

TEST REPORT REFERENCE NUMBER / JOB NUMBER :

SWL19488

Dear Sir / Madam

Herewith please find the original reports pertaining to the above mentioned project.

Test Requested

Site Sampling and Materials Information

1x FOUNDATION INDICATOR

Sampling Method TMH5 MA2

Environmental Condition Rainy

FINAL REPORT

We would like to take this opportunity to thank you for your valued support.

Should you have any further enquiries please don't hesitate to contact me.

Yours Faithfully

STEYN-WILSON LABORATORIES (PTY) LTD

Remarks:

1. Information contained herein is confidential to STEYN-WILSON PTY LTD and the addressee
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3. The samples were subjected and analysed according to ASTM.
4. The results reported relate only to the sample tested, Further use of the attached information is not the responsibility or liability of STEYN-WILSON LABORATORIES (PTY) LTD.
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6. Measuring equipment is traceable to national standards (Where applicable).
7. Should there be any deviation from the prescribed test method comments will be made thereof, pertaining to the test on the relevant materials report.

Mr. R. Wilson
Technical Signatory

DIRECTORS: Mr. J. Steyn ND-Civil (Managing) | Mr. R. Wilson B-Tech Civil (Operations)
FINANCIAL MANAGER: Mr. D. Erasmus (SAICA Reg No: 200522562)
LABORATORY MANAGER: Mr. K. Booysen



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Customer : Kantey & Templer (Pty) Ltd

P.O. Box 3132

Cape Town

8000

Attention : Mr L Celliers

Project : ERF 7001 - Cloeteville

Date Received : 22/09/22

Date Reported : 29/09/22

Req. Number : -

FOUNDATION INDICATOR ASTM D422

Material Description:	Silty SAND	Sample Number:	21899		
Position:	TH 7	Liquid Limit	25,5	Linear Shrinkage	4,4
Depth:	0.22 - 0.85m	Plasticity Index	9,1	Insitu M/C%	6,4

PH (TMH1 A20)* 4,6

(TMH1 A21T)*
Conductivity
s.m⁻¹ 0,044

SG (TMH1 A12T)* 2,632

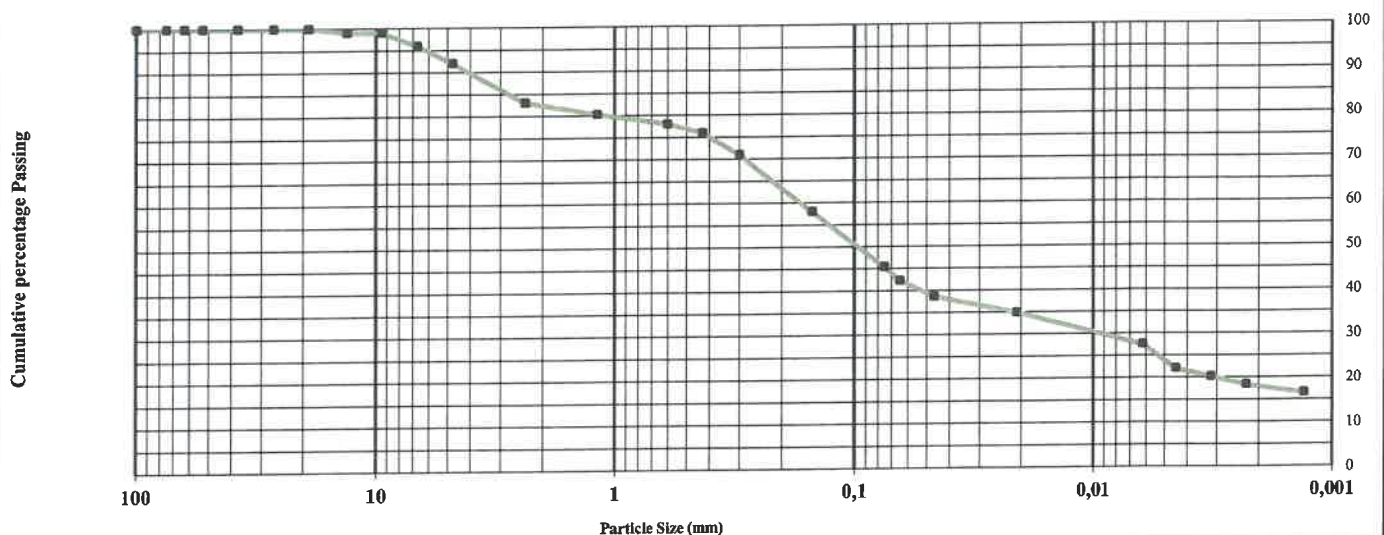
SIEVE ANALYSIS (TMH 1 A1a)*

HYDROMETER ASTM D422

100	75	63	53	37,5	26,5	19,0	13,2	9,5	6,7	4,75	2,36	1,18	0,60	0,425	0,300	0,150	0,075	0,065	0,046	0,021	0,006	0,004	0,003	0,002	0,001
100	100	100	100	100	100	100	99	99	96	92	83	80,3	78	76	71	58	45,4	42,32	38,64	34,96	27,6	22,08	20,24	18,4	16,56

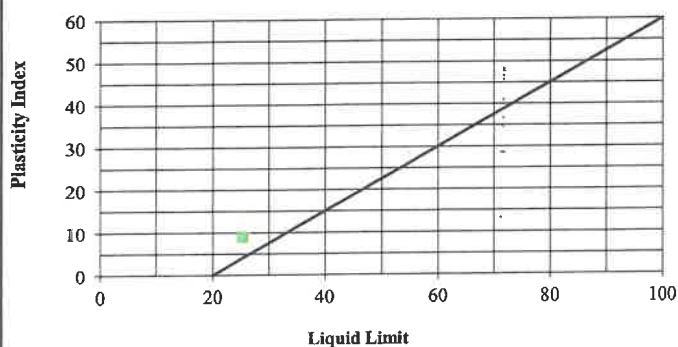
% Passing

Particle Size Distribution

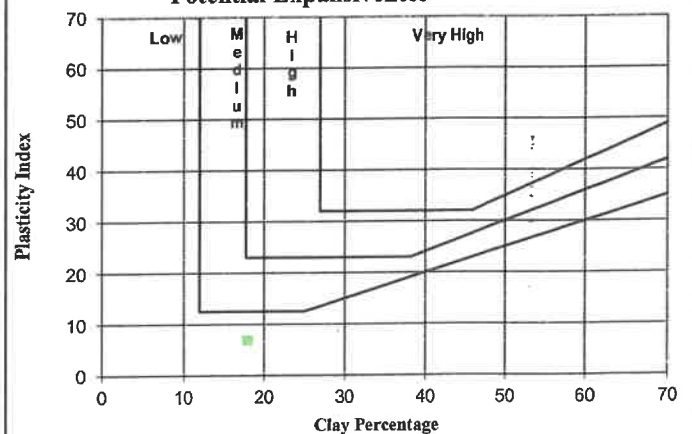


% Gravel	18	% Sand	41	% Silt	23	% Clay	18
----------	----	--------	----	--------	----	--------	----

Plasticity Chart A Line



Potential Expansiveness



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Client: **Kantey & Templer (Pty) Ltd**

Project: **ERF 7001 - Cloetessville**

Attention: **Mr L Celliers**

Your Ref. No: **-**

Date Reported **29/09/22**

TEST REPORT REFERENCE NUMBER / JOB NUMBER :

SWL19488

Dear Sir / Madam

Herewith please find the original reports pertaining to the above mentioned project.

Test Requested

3x MDD / CBR /IND

Site Sampling and Materials Information

Sampling Method

TMH5 MA2

Environmental Condition

Rainy

FINAL REPORT

We would like to take this opportunity to thank you for your valued support.

Should you have any further enquiries please don't hesitate to contact me.

Yours Faithfully

STEYN-WILSON LABORATORIES (PTY) LTD

Remarks:

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7. Should there be any deviation from the prescribed test method comments will be made thereof, pertaining to the test on the relevant materials report.

Mr. R. Wilson
Technical Signatory

DIRECTORS: Mr. J. Steyn ND-Civil (Managing) | Mr. R. Wilson B-Tech Civil (Operations)
FINANCIAL MANAGER: Mr. D. Erasmus (SAICA Reg No: 200522562)
LABORATORY MANAGER: Mr. K. Booysen

JOB NO: SWL19488		Your Ref		Date: 29/09/22	
Kantey & Templer (Pty) Ltd P.O. Box 3132 Cape Town 8000		ERF 7001 - Cloeteville			
ATTENTION: Mr L Celliers					
TMH5 MD1, MD2 / SANS 3001 GR1, PR5, GR10, GR12, GR30, GR40					
The unambiguous description of the sample/s as received are as follows :					
SAMPLE No.		21894	21893	21892	
HOLE No. / SV. / CHAINAGE		TH 2	TH 4	TH 4	
ROAD No. OR NAME		-	-	-	
LAYER TESTED / SAMPLED FROM		0.25 - 0.65m	0.0 - 0.4m	0.4 - 0.75m	
DATE RECEIVED		22/09/22	22/09/22	22/09/22	
PROJECT		ERF 7001 - Cloeteville	ERF 7001 - Cloeteville	ERF 7001 - Cloeteville	
DESCRIPTION OF SAMPLE (COLOUR & TYPE)		Light Orange Clay Soil with Sandstone	Light Brown Fine Sand with Sandstone	Light Yellowish Orange Clay Soil with Sandstone	
REDUCTION FACTOR / RF CHECK		0,0656	0,0474	0,0528	
		0,07	0,08	0,07	
SIEVE ANALYSIS (mm) SANS 3001 GR1	100,0	100	100	100	
	75,0	100	100	100	
	63,0	100	100	100	
	53,0	100	100	100	
	37,5	100	99	100	
	28,0	100	98	99	
	20,0	98	97	96	
	14,0	94	89	92	
	5,00	61	77	69	
	2,00	47	66	53	
	0,425	44	57	48	
	0,075	27	29	29	
ATTERBERG LIMITS SANS 3001 GR10, GR12	LL%	23,3	NP	25,8	
	P.I.	6,9	NP	10,1	
	LS%	2,9	0,0	4,8	
	GM	1,81	1,48	1,70	
SOIL-MORTAR PERCENTAGES SANS 3001 PR5	Coarse sand	8	13	10	
	Fine sand	35	43	36	
	Coarse fine sand	8	13	7	
	Medium fine sand	12	14	14	
	Fine fine sand	15	16	15	
	Silt and clay	57	43	54	
MOD AASHTO SANS 3001 GR30	Coarse sand ratio	0,1	0,1	0,1	
	OMC%	8,3	10,2	11,2	
C.B.R. SANS 3001 GR40	MDD(KG/M ³)	2011	2160	2036	
	COMP MC	8,2	9,9	11,1	
	% SWELL	1,1	0,0	1,39	
	100%	11	20	15	
	98%	7	16	12	
	97%	6	14	10	
	95%	4	12	7	
	93%	3	9	5	
	90%	2	7	3	
	Conductivity (TMH1 A21T)				0,055
PH (TMH1 A20)				5,0	
TEST TYPE		SANS - MOD.CBR.IND	SANS - MOD.CBR.IND	SANS - MOD.CBR.IND	
REMARKS / NOTES		-	-	-	

NOTE: All tests marked with (*) means that those test methods are not accredited.

**STEYN-WILSON
LABORATORIES****CIVIL ENGINEERING TESTING LABORATORIES**

11 Gooderson Road Blackheath

PO Box 58 Blackheath 7581

Tel: 021 905 0435

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Email: admin@steynwilson.co.zaWeb: www.steynwilson.co.za

Client: Kantey & Templer (Pty) Ltd

Project: ERF 7001 - Cloetessville

Attention: Mr L Celliers

Your Ref. No: -

Date Reported 29/09/22

TEST REPORT REFERENCE NUMBER / JOB NUMBER :**SWL19488**

Dear Sir / Madam

Herewith please find the original reports pertaining to the above mentioned project.

Test Requested

1x MDD / CBR /IND

Site Sampling and Materials Information

Sampling Method	TMH5 MA2
Environmental Condition	Rainy

FINAL REPORT

We would like to take this opportunity to thank you for your valued support.
Should you have any further enquiries please don't hesitate to contact me.

Yours Faithfully

STEYN-WILSON LABORATORIES (PTY) LTD

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LABORATORY MANAGER:	Mr. K. Booysen


STEYN-WILSON
LABORATORIES

CIVIL ENGINEERING TESTING LABORATORIES



Accreditation No.: T0835

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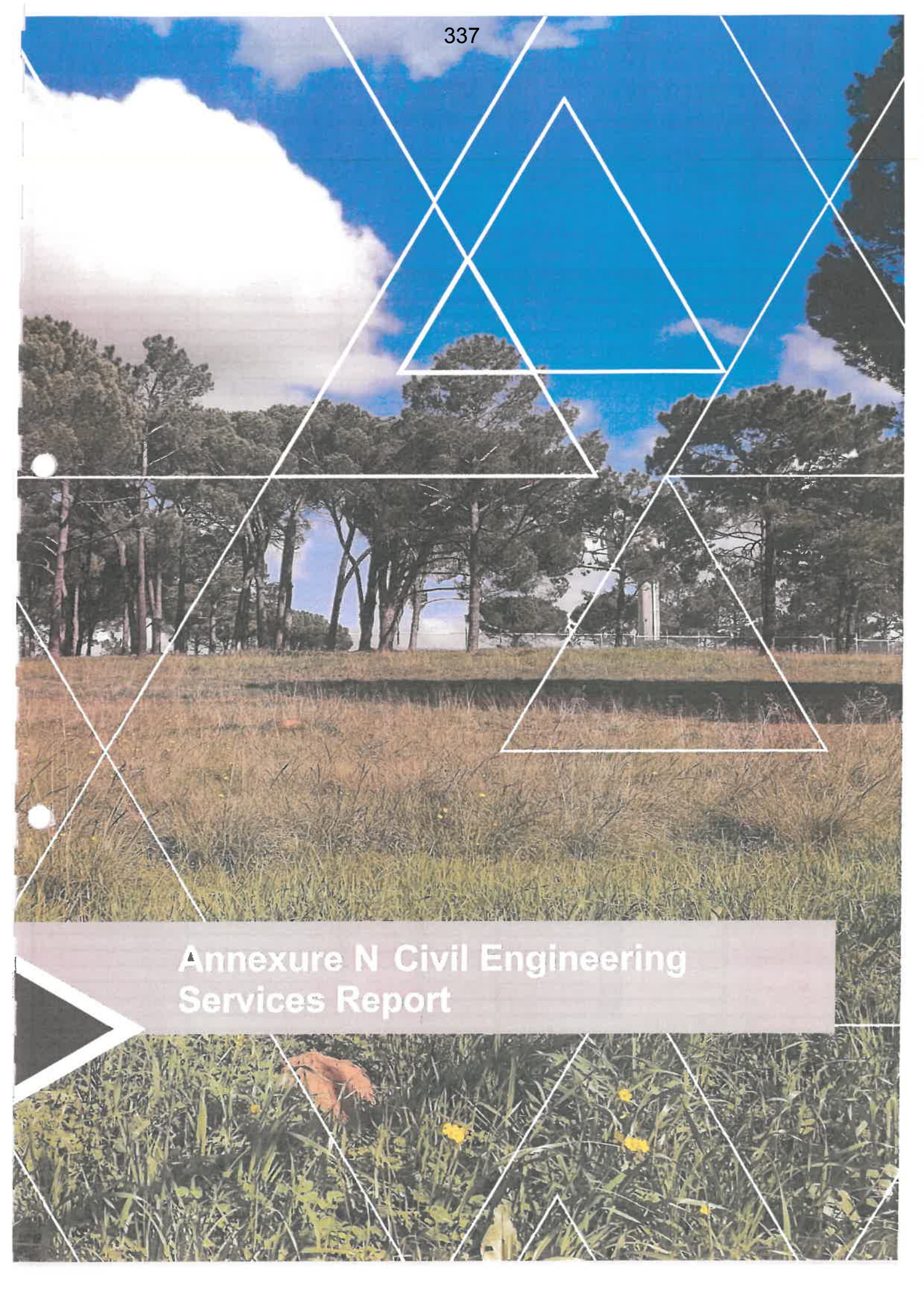
Tel: 021 905 0435

Fax: 086 499 9482

Email: info@steynwilson.co.zaWeb: www.steynwilson.co.za

JOB NO: SWL19488		Your Ref		Date: 29/09/22	
Kantey & Templer (Pty) Ltd		ERF 7001 - Cloeteville			
P.O. Box 3132					
Cape Town					
8000					
ATTENTION: Mr L Celliers					
TMH5 MD1, MD2 / SANS 3001 GR1, PR5, GR10, GR12, GR30, GR40					
The unambiguous description of the sample/s as received are as follows :					
SAMPLE No.		21892			
HOLE No. / SV. / CHAINAGE		TH 8			
ROAD No. OR NAME		-			
LAYER TESTED / SAMPLED FROM		0.13 - 0.65m			
DATE RECEIVED		22/09/22			
PROJECT		ERF 7001 - Cloeteville			
DESCRIPTION OF SAMPLE (COLOUR & TYPE)		Light Reddish Brown Fine Sand with Sandstone			
REDUCTION FACTOR / RF CHECK		1,0000			
SIEVE ANALYSIS (mm) SANS 3001 GR1	100,0	100			
	75,0	100			
	63,0	100			
	53,0	100			
	37,5	100			
	28,0	100			
	20,0	100			
	14,0	100			
	5,00	96			
	2,00	90			
	0,425	76			
	0,075	32			
ATTERBERG LIMITS SANS 3001 GR10, GR12	LL%	NP			
	P.I.	NP			
	LS%	0,0			
	GM	1,02			
SOIL-MORTAR PERCENTAGES SANS 3001 PR5	Coarse sand	15			
	Fine sand	49			
	Coarse fine sand	16			
	Medium fine sand	18			
	Fine fine sand	15			
	Silt and clay	36			
MOD AASHTO SANS 3001 GR30	OMC%	10,1			
	MDD(KG/M ³)	2083			
C.B.R. SANS 3001 GR40	COMP MC	10,4			
	% SWELL	0,0			
	100%	21			
	98%	16			
	97%	14			
	95%	11			
Conductivity (TMH1 A21T)					
	PH (TMH1 A20)				
	TEST TYPE	SANS - MOD.CBR.IND			
REMARKS / NOTES					

NOTE: All tests marked with (*) means that those test methods are not accredited.



Annexure N Civil Engineering Services Report

Engineering Services Report

A Broad Conceptual Urban Design Framework for Erf 7001, Cloetesville

Stellenbosch Municipality

Submission date: 2023/11/30

Document number: Cloetesville Urban Design Framework Engineering Services Report
Revision: 0

Document control record

Document prepared by:

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Document Control					
Project name		A Broad Conceptual Urban Design Framework for Erf 7001, Cloetesville			
Document number		Cloetesville Urban Design Framework Engineering Services Report	Project number		1001918
Client		Stellenbosch Municipality			
Client contact		L. Vanstavel	Client reference		BSM 118/21
Rev	Date	Revision details/status	Author	Reviewer	Approver
0	2023/11/30	For circulation	Elzaan Jordaan	Chris van der Walt	Chris van der Walt
Current revision		0			

Approval			
Author signature		Approver signature	
Name	Elzaan Jordaan	Name	Chris van der Walt
Title	Civil Engineer	Title	Associate

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Contents

1 INTRODUCTION	5
2 Purpose of this report	5
3 Site locality and description	5
4 Description of the proposed development	6
4.1 Proposed development	6
4.2 Geotechnical investigation	7
4.3 Traffic Impact Assessment	8
5 POTABLE WATER SUPPLY	8
5.1 Impact on bulk water capacity	8
5.1.1 Network capacity	8
5.2 Water demand calculation	9
5.3 Internal reticulation	9
5.4 Fire Fighting Requirements	10
6 SANITATION	10
6.1 Impact on bulk sewage	10
6.1.1 Network capacity	11
6.2 Sewage Yield Calculation	11
6.3 Internal Sewage Reticulation	11
7 STORMWATER MANAGEMENT	12
7.1 Design Philosophy	13
7.2 Rainfall Data	13
7.3 Pre-development Flood Run-off	14
7.4 Post-development Flood Run-off	15
8 ROADS	17
8.1 Access	17
8.2 Internal roads	17
8.3 Parking Facilities	17
9 Electrical Services	18
10 Solid Waste Disposal	18
11 Conclusion	19
12 Bibliography	19

Appendices

Appendix A: Subdivision and Zoning Plan

Appendix B: Traffic Impact Assessment

Appendix C: Electrical Services Report

Figures

Figure 1: Erf 7001 Locality Map

Figure 2: Cloeteville Housing Development Proposed Subdivision Plan

Figure 3: Proposed water reticulation

Figure 4: Proposed sewer system

Figure 5: Existing stormwater system and overland flow

Figure 6: Proposed post-development stormwater network

Figure 7: Proposed electrical mini substation positions

Tables

Table 1: Potable water demand calculation

Table 2: Sewage yield calculation

Table 3: The various RI storm events and related rainfall depths

Table 4: Pre-development calculation sheet

Table 6: Combined post-development calculated peak flows

1 INTRODUCTION

Stellenbosch Municipality has undertaken the task to appoint an experienced and professional consultant to undertake a Broad Conceptual Urban Design Framework for Erf 7001, Stellenbosch and to obtain town planning and development rights. Zutari was selected to be the lead consultant for this multidisciplinary project.

The main objective of the project is to undertake a Broad Conceptual Urban Design framework for Erf 7001, Cloetesville, Stellenbosch, and to obtain town planning and development rights. The Stellenbosch Municipality identified a need for integrated urban settlement developments to address municipal housing backlogs. Erf 7001, Cloetesville was identified as a suitable site for such a development.

The project aims to facilitate a sustainable integrated development including medium to upper income housing units (GAP) that will address housing needs in Cloetesville and ensure social and economic sustainability of the inhabitants of Cloetesville and beneficiaries as defined by the Stellenbosch Municipality.

2 Purpose of this report

This report addresses the needs of Stellenbosch Municipality regarding the provision of engineering services for the Cloetesville Housing Development Project. The infrastructure design of the development is based on technical requirements and guidelines as stated in the Design Guidelines and Minimum Standards for Civil Engineering Services (Stellenbosch Municipality, 2015) and the general subdivision/rezoning conditions. Additionally, design considerations are also based on the Guidelines for Human Settlement Planning and Design (Department of Human Settlements, 2019) and the Drainage Manual 6th Edition (SANRAL, 2013).

The level of service for the proposed infrastructure will be to the accepted standard associated with that of the various proposed housing topologies **as per the architect's details**.

This services report has been compiled based on the following available information:

- The latest Site Development Plan (SDP);
- Traffic Impact Assessment (TIA);
- Electrical Services Report.

3 Site locality and description

Erf 7001 is located in Ward 17 in Cloetesville, Stellenbosch. The Ward is a predominantly residential ward which includes a part of Cloetesville as well as Welgevonden, Green Oaks, Stellita Park, Weltevrede and the Municipal Flats in Rhode, Kloof and Long Streets as shown in Figure 1 below. The ward is bordered by the R44 Klappmuts road, Lakey and Long streets. The site is located west of the R44. It is in close proximity to a primary school and local sports ground. Erf 7001 is characterised by numerous trees.

The site slopes to the North and North East boundary at an average gradient of 6% - 8%. The highest point is at the existing reservoir erf at an elevation of 185.5m MAMSL. The lowest point is at the centre of the Western boundary at an elevation of 173m MAMSL.



Figure 1: Erf 7001 Locality Map

4 Description of the proposed development

4.1 Proposed development

The proposed Cloeteville Housing Development comprises the following land uses:

- 203 Conventional single Residential Zone stands;
- Public Roads.

Please refer to Figure 2 which illustrates the subdivision and zoning plan. The erven size ranges from 115m² to 159m² and from 160m² to 200 m² for single residential units.



Figure 2: Cloetesville Housing Development Proposed Subdivision Plan

4.2 Geotechnical investigation

Kantey and Templer Consulting was appointed by Stellenbosch Municipality to prepare a geotechnical report for Erf 7001 for the proposed development.

Erf 7001 Cloetesville has been identified for possible residential development which comprises GAP housing (dwellings) located in terrain composed of and underlain at shallow depth by shales of the Tygerberg Formation, Malmesbury Group.

The subsoil profile, in general, is composed of naturally transported surficial soils which are resting on residual material a underlain by weathered shales.

Conditions for the use of conventional foundations at shallow depth are considered favourable **classifying as 'S' in terms of the NHBRC site class designation. Accordingly, founding options allow for conventional strip and slab-on-ground foundations.**

Groundwater conditions are considered favourable with a perched water table developing during periods of high rainfall. Given the steep topography of the bulk of the site, erosion associated with surface runoff can be expected.

Development costs may need to be increased due to:

- the non-availability of materials suitable for re-use on site;
- the unfavourable subgrade conditions;
- the need for measures to control the shallow presence of groundwater/surface runoff.

4.3 Traffic Impact Assessment

Zutari consulting engineers conducted a separate Traffic Impact Assessment (TIA) as per the Stellenbosch Municipality's requirements (See Appendix B). The Traffic impact assessment investigated the impact on the traffic flows in the area.

Based on the assessment of future traffic conditions, all the study intersections inside Cloeteville can operate at acceptable Levels of Service. All the future scenarios continue to operate at the same Levels of Service as the background traffic scenario. This is evidence that the delay and LOS issues at the key intersections are systemic and not as a result of the introduction of the development. Minor adjustments to the R304 intersection can improve the LOS for all approaches. But the intersection of R44 and Hendrickse Road currently experiences severe delays that require attention.

In summary, the following upgrades are recommended:

- The R44 x Hendrickse intersection requires immediate attention from the Municipality and/or the Western Cape Government, regardless of the proposed development. It has been demonstrated that minor changes to the signal phasing can have a positive impact on the overall Levels of Service but cannot resolve the poor Level of Service on the Hendrickse approach.
- An option for consideration is providing another signalised intersection at Fir Road which is currently two-way stop controlled. Providing another signalised access for Cloeteville will help distribute traffic and alleviate the pressure at Hendrickse Road.
- The lane configuration at R304 x Welgevonden intersection is not optimal for the volumes of traffic modelled in this report. This report proposes a change in the intersection configuration **that can be accommodated in the existing roadway through a "line marking exercise"**. Though it should be highlighted and stressed that in the light of future development in the area and the natural growth in traffic, the intersection will need to be upgraded.
- Should there be an increase in delays experienced at the Hendrickse x Williams intersection, the Municipality can consider converting it to a two way stop control intersection. The modelling indicates an improved LOS because of the significantly high volumes of traffic on Hendrickse Road compared to Williams Road.
- An increase in pedestrian activity is expected, consideration must be given to expanding the provision of sidewalks along Hendrickse Road and Gabriels Road to link with Lang Street which is the main route for public transport within Cloeteville.

5 POTABLE WATER SUPPLY

5.1 Impact on bulk water capacity

GLS Consulting engineers were approached to comment on the service integration and impact on the bulk supply network of Cloeteville housing development. This section should be read in conjunction with the Water Master Plan (performed for the Stellenbosch Municipality) dated June 2023.

5.1.1 Network capacity

Cloeteville is currently supplied with water from the existing 2.8 ML Cloeteville Reservoir and 50 kl Cloeteville Tower. There is insufficient capacity in the existing water reticulation system to accommodate the proposed development.

The following bulk network upgrades will be required:

- New 7.0 ML Reservoir top water level at 188.0m;
- Upgrading of existing pumps from the reservoir to the water tower;

- Upgrading of existing pumps from the Idas Valley reservoir to Uniepark Reservoir which feeds the existing Cloeteville reservoir.

5.2 Water demand calculation

The potable water demand for the proposed development was calculated based on The Redbook, which recommends 0.40 kl/day/unit for high density group housing with an erf size between 130m² and 200m², 0.45 kl/day/unit for medium density group housing with a size between 200m² and 270m² and 0.3 kl/day/unit for low-income housing high density erven above 270m². The potable water calculations are shown in Table 1 below.

Table 1: Potable water demand calculation

POTABLE WATER DEMAND CALCULATIONS				PROJECT:		Erf 7001 Cloetesville		
<div> IMPACT. ENGINEERED.</div>				Project no:		1001918		
				Calculated by:		E. Jordaan	Rev:	0
				Checked by:		C van der Walt	Date:	2023/11/28
ANNUAL AVERAGE DAILY WATER DEMAND SCHEDULE								
Item no	Land use description	Amount of Units		Unit area (sqm)	Water demand rate per day		TOTAL DEMAND (l/d)	
		Qty	type		Rate per unit:	Rate by Area:		
					litre per unit	litre per sqm.		
	Residential							
1	Conventional Residential Zone Stands	168	units	130 - 200	400		67,200	
2	Conventional Residential Zone Stands	10	units	200- 270	450		4,500	
3	Conventional Residential Zone Stands	25	units	270 -400	300		7,500	
						Subtotal 1	79,200	
						Plus 10% losses	7,920	
						Subtotal 2	87,120	
GENERAL NOTES:				WATER UTILIZATION SUMMARY				
				TOTAL ANNUAL AVERAGE DAILY WATER DEMAND (l/d)			87,120	
				PEAK FLOW CONDITIONS:				
				Fire Fighting Flow Rate (l/s):			15	
				Instantaneous Peak Factor:			4.6	
				Instantaneous Peak Flow, Incl fire (l/s):			20	

From Table 1 it can be concluded that the potable water Annual Average Daily Demand (AADD) for the proposed development is 87,12 kl/d and the instantaneous peak flow is 20 l/s.

5.3 Internal reticulation

Regarding the water demand calculations in the section above, the approximate reticulation network pipe size for the development was determined.

The minimum diameter required by the Municipality for potable water pipes is 100 mm (Stellenbosch Municipality, 2015). Therefore, the proposed development was modelled with a 110mm diameter pipe network. For modelling, a 40 m pressure head was assumed at the connection point. Consequently, it was found that a 110 mm diameter internal reticulation network is sufficient for the development with firewater included in the potable water network.

The internal network will consist of HDPE PN12.5 PE 100 pipes which are the minimum requirement (Stellenbosch Municipality, 2015). A layout of the preliminary looped water network model is shown in Figure 3.

It is recommended that water saving mechanisms must be prescribed as part of the title deeds agreements and building guidelines, such as:

- Rainwater harvesting
- Greywater recycling

- Installation of toilets fitted with dual flush systems.
- Aerator nozzles fitted to taps and showers.
- Water-wise irrigation practices, such as the planting of indigenous plants, installation of timers.



Figure 3: Proposed water reticulation

5.4 Fire Fighting Requirements

According to The Red Book (2019), firefighting flow should be supplied at 15 l/s and 1 bar of pressure at the connection and must be available during peak instantaneous flow. For the proposed development, it is possible to allow for fire flow on the potable water line. Hydrants in the network will be spaced at a maximum of 240 m as per local authority standards (Stellenbosch Municipality, 2015). The necessary firefighting requirements will be included in the design of the development services.

6 SANITATION

6.1 Impact on bulk sewage

GLS Consulting engineers were approached to comment on the service integration and impact on the bulk supply network of Cloeteville housing development. This section should be read in conjunction with the Water Master Plan (performed for the Stellenbosch Municipality) dated June 2023.

There is sufficient capacity in the existing sewer reticulation system to accommodate the proposed development.

- Upgrading of the bulk sewer line form Kayamandi to Merriman Street.

The development will typically have high density residential irrigation demands. Each conventional stand will have a small garden and grass area. Therefore, the percentage of potable water demand which will be converted to sewage yield was estimated as 90% to 95%. The calculations for daily sewage yield are shown in Table 2.

SEWAGE YIELD CALCULATIONS 				PROJECT: Erf 7001 Cloetesville Project no: 1001918 Calculated by: E. Jordaan Rev: 0 Checked by: C van der Walt Date: 2023/11/28			
ANNUAL AVERAGE DAILY SEWAGE YIELD SCHEDULE							
Item no	Land use description	Amount of Units		Unit area (sqm)	Sewage yield rate per day		TOTAL YIELD (l/d)
		Qty	type		Water demand (excl. infiltration)	Sewer Flow % AADD	
	Residential						
1	Conventional Residential Zone Stands	168	units	130 - 200	67,200	90.00%	60480
2	Conventional Residential Zone Stands	10	units	200- 270	4,500	90.00%	4050
3	Conventional Residential Zone Stands	25	units	270 -400	7,500	95.00%	7125
GENERAL NOTES:				SEWAGE YIELD SUMMARY			
				DAILY SEWAGE YIELD VOLUMES			
				Annual Average Daily Dry Weather Flow (l/d) 71,850			
				Infiltration factor (%) 15.0%			
				TOTAL ANNUAL AVERAGE DAILY WET WEATHER FLOW (l/d) 82,403			
				PEAK FLOW CONDITIONS:			
				Instantaneous Peak Factor: 2.5			
				Instantaneous Peak Dry Weather Flow (l/s) 2.07			
				Instantaneous Peak Wet Weather Flow (l/s): 2.4			

From **Error! Reference source not found.** it can be concluded that the additional annual average wet weather sewage flow yield generated by the proposed future development is 82.4 kℓ/d. The instantaneous sewage peak flow is calculated as 2.4 ℓ/s.

A conventional uPVC Class 34 waterborne sewage system with a minimal diameter of 160 mm will be installed with connections to each erf. A layout of the preliminary sewer network is shown in Figure 4.

According to the Crimp & Bridges Tables the maximum capacity of a 160 mm uPVC pipe at 1:150 slope is 14.1 l/s. Considering the calculated peak sewage flow from the proposed development 2.4 l/s, a 160 mm uPVC network is sufficient.

No onsite sewage settling, or treatment will be done. All sewage will be directed towards the municipal bulk sewage network where it will be treated and discharged as per the municipal sewage management plan which has sufficient capacity to treat the raw sewage flow.

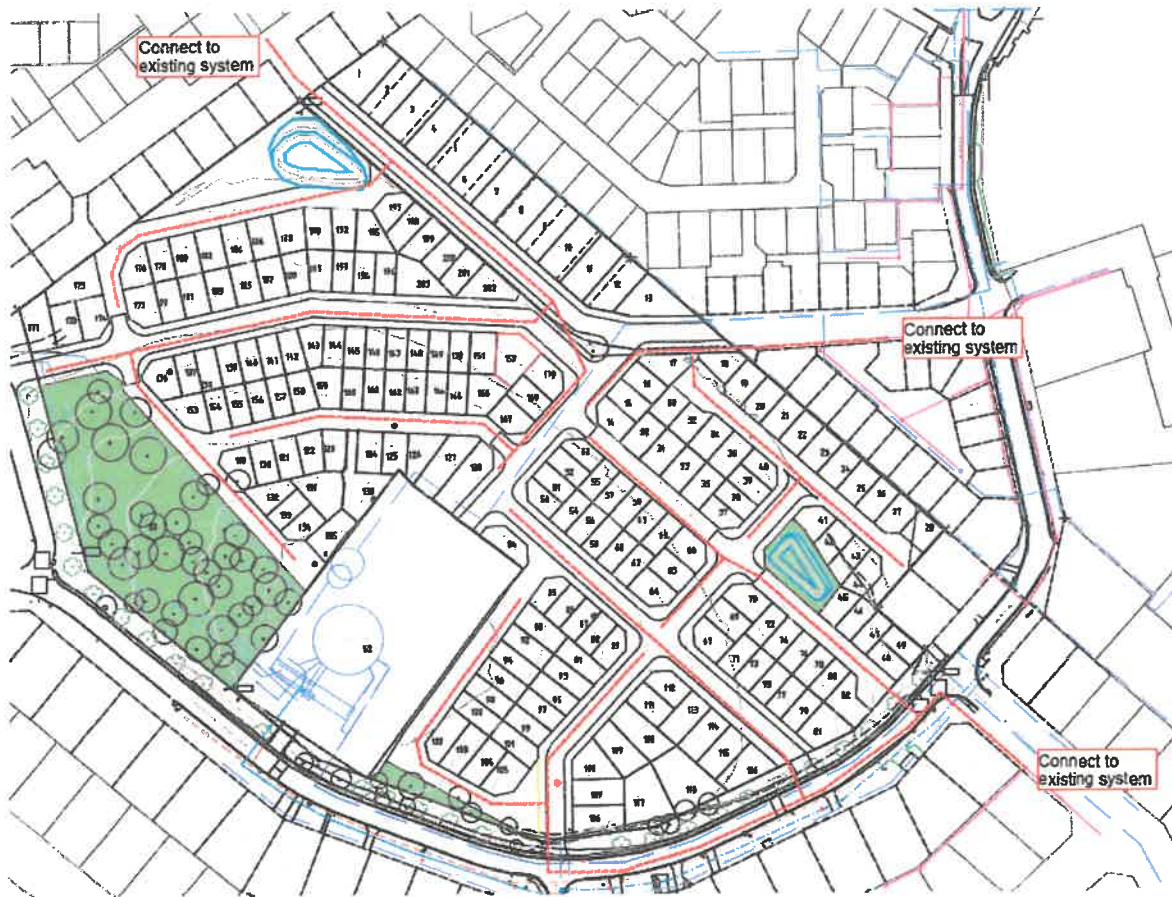


Figure 4: Proposed sewer system

7 STORMWATER MANAGEMENT

The site vegetation predominantly comprises of low grasses and scattered concentration of mature pipe trees. The in-situ soil conditions are semipermeable shales of Malmesbury Group which is mantled by residual and transported soils of various thickness. The majority of the site drains to the north where a cut-off earth channel directs the water to an existing headwall connected to the existing municipal system in the northern corner of the site. Figure 5 shows how surface water flows to the existing channels.

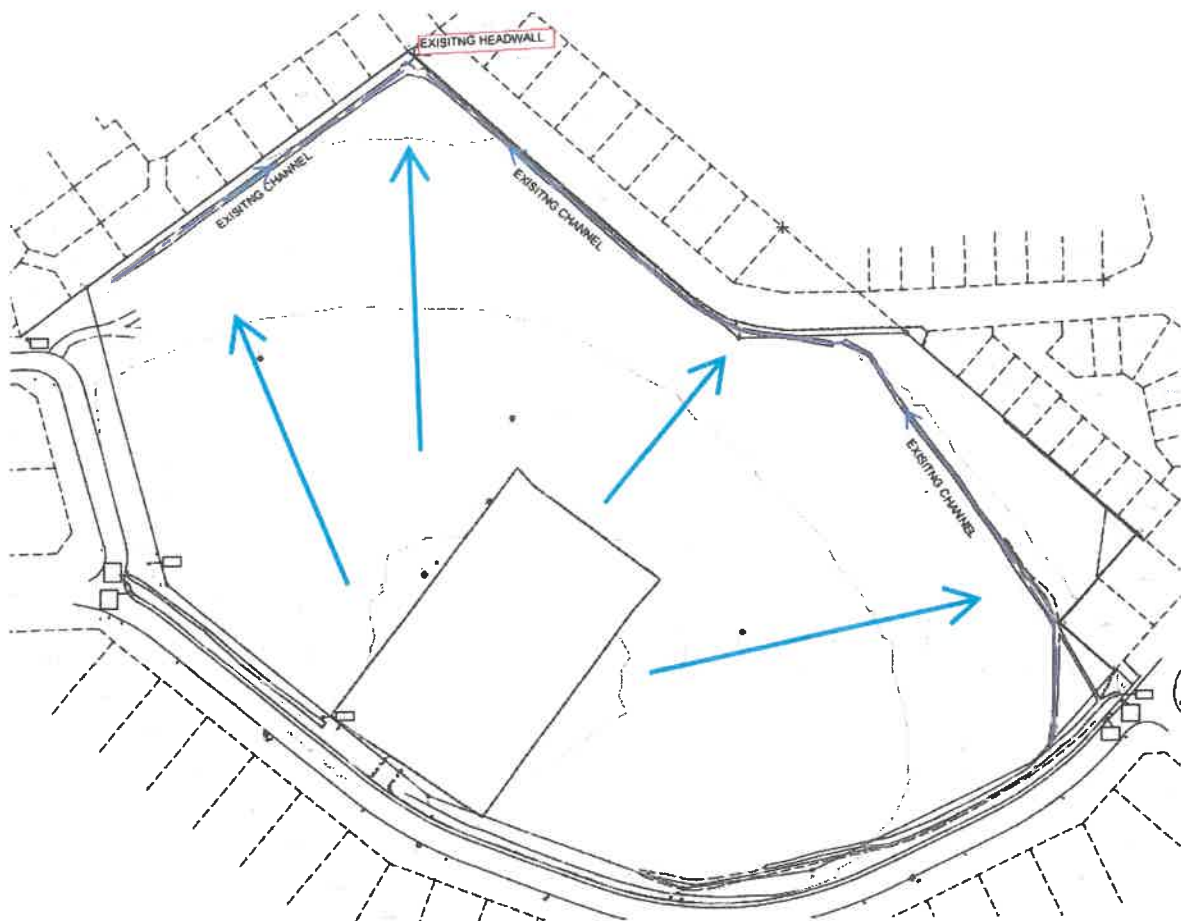


Figure 5: Existing stormwater system and overland flow

7.1 Design Philosophy

The standard stormwater guidelines for residential developments as per CSIR (2005), and Drainage Manual (SANRAL, 2013), was used for the design of the proposed new internal stormwater system.

Specific attention will be given to the following:

- Stormwater run-off will be calculated using the Rational Method;
- Minor flows: Stormwater will be conveyed to stormwater grid/side inlets and formally piped to safe discharge points / detention dams;
- Major flows: Safe overland flow directed to the proposed detention dam will be allowed for;
- For various recurrence interval (RI) storm event, the peak run-off after development will not exceed the peak run-off prior to development.
- Temporary stormwater management measures will be implemented and adhered to during construction.

7.2 Rainfall Data

The Design Rainfall Estimation Program provides the 2 to 200-year recurrence interval (RI) rainfall depths for various duration storm events for a specific longitude and latitude location. The 24-hour duration storm RI rainfall depths are provided in Table 3 below.

Table 3: The various RI storm events and related rainfall depths

Return Period (R) (years)	Rainfall depth (mm)
2	48.9
5	65.7
10	77.8
20	90.5
50	108.3
100	122.8
200	138.4

7.3 Pre-development Flood Run-off

The pre-development (greenfield site) stormwater runoff for various storm-events were calculated using the rational method. For the pre-development scenario, the site is considered to be in greenfield condition and all areas drain to a central point. The calculation sheet for the catchment in the pre-development model is shown in Table 4.

Table 4: Pre-development calculation sheet

FLOOD RUN-OFF CALCULATIONS				PROJECT: Cloetesville			
 IMPACT. ENGINEERED.		Project no: 1001918					
		Catchment Name: East catchment					
		Calculation Method: Rational Method					
		Calculated by: E Jordaan					
		Date: 28 November 2023					
		Checked By: Chris van der Walt		Signed: _____			
		Date: _____					
Catchment characteristics							
Description of catchment		RESIDENTIAL: Pre Development for Pond 1					
Name of watercourse (if applicable)		N/A					
Physical characteristics			Meteorological characteristics				
Size of catchment (A)	0.056 km ²	Rainfall region:					
Longest watercourse (L)	0.440 km	Weather Service station					
Average slope (S _{av})	0.080 m/m	Weather Service number					
Dolomitic area (D _%)	0%	Mean annual precipitation (MAP)					
		2-year return period rainfall (M)					
		Days of thunder per year (R)					
		Comments:					
Catchment run-off coefficients							
Rural			Urban				
Surface slope	%	Factor	C _s	Description	%	Factor	C _s
Visis and pans	0.0%	0.03	0.000	Lawns in sandy soil, flat grade(<2%)		0.10	0.000
Flat Areas	80.0%	0.08	0.064	Lawns in sandy soil, steep grade(>7%)		0.20	0.000
Hilly	20.0%	0.16	0.032	Lawns in heavy soil, flat grade(<2%)		0.17	0.000
Steep Areas		0.26	0.000	Lawns in heavy soil, steep grade(>7%)		0.35	0.000
Total	100.0%	-	0.096	Residential: Houses	0.00%	0.50	0.000
Permeability	%	Factor	C _p	Residential: Flats		0.70	0.000
Very permeable	0.0%	0.04	0.000	Light industry		0.80	0.000
Permeable	45.0%	0.08	0.036	Heavy industry		0.90	0.000
Semi-permeable	50.0%	0.16	0.080	Business complexes in the city centre		0.95	0.000
Impermeable	5.0%	0.26	0.013	Business complexes in suburban areas		0.70	0.000
Total	100.0%	-	0.129	Street area		0.95	0.000
Vegetation	%	Factor	C _v	Maximum Flood		1.00	0.000
Thick bush and plantation	2.0%	0.04	0.001	Total (C ₂)	0.00%	-	0
Light bush and farm-lands	0.0%	0.11	0.000	Notes:			
Grasslands	93.0%	0.21	0.195				
No vegetation	5.0%	0.28	0.014				
Total	100.0%	-	0.210				
Adjustment of run-off coefficients							
Return period (years), T	2	5	10	20	50	100	Max
Rural run-off coefficient, C ₁ (C ₁ = C _s + C _p + C _v)	0.435	0.435	0.435	0.435	0.435	0.435	
Adjustment of above for dolomitic areas, C ₁₀ (= C ₁ (1 - D _%) + C ₁ D _% (Σ(D _{factor} × C _{3%})))	0.435	0.435	0.435	0.435	0.435	0.435	
Adjustment factor for initial saturation of rural areas, F _i	0.500	0.550	0.600	0.670	0.830	1.000	
Adjusted rural run-off coefficient, C ₁₁ (= C ₁₀ × F _i)	0.218	0.239	0.261	0.292	0.361	0.435	
Combined run-off coefficient, C _r (= αC ₁₁ + βC ₂ + γ1)	0.218	0.239	0.261	0.292	0.361	0.435	
Time of concentration (T _c)							
Overland/Sheet flow	Defined watercourse	Notes:					
$T_o = \left(\frac{rL}{\sqrt{S_w}} \right)^{0.487}$	$T_c = \left(\frac{0.87L^2}{1000S_w} \right)^{0.385}$	Assume small catchment with T _c = 15 minutes at least.					
0.70 hours	0.25 hours						
Flood run-off: Rational method							
Return Period (years), T	2	5	10	20	50	100	Max
Point rainfall (mm), P _T	13.700	18.300	21.700	25.200	30.200	25.700	
Point intensity (mm/hour), P _{IT} (= P _T /T _c)	19.556	28.122	30.976	35.972	43.109	36.686	
Area reduction factor (%), ARF _T	95.000%	95.000%	95.000%	95.000%	95.000%	95.000%	
Average intensity (mm/hour), I _T (= P _{IT} × ARF _T)	18.578	24.816	29.427	34.173	40.954	34.851	
Peak flow (m ³ /s) $Q_T = \frac{C_r I_T A}{3.6}$	0.063	0.092	0.120	0.155	0.230	0.236	
Flood run-off: Alternative rational method							
Return Period (years), T	2	5	10	20	50	100	Max
Point rainfall (mm), P _T	13.846	23.358	30.554	37.750	47.282	54.458	
Point intensity (mm/hour), P _{IT} (= P _T /T _c)	19.765	33.343	43.815	53.886	67.464	77.736	
Area reduction factor (%), ARF _T	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	
Average intensity (mm/hour), I _T (= P _{IT} × ARF _T)	18.777	31.676	41.434	51.182	64.091	73.849	
Peak flow (m ³ /s) $Q_T = \frac{C_r I_T A}{3.6}$	0.064	0.118	0.168	0.232	0.380	0.500	

7.4 Post-development Flood Run-off

In line with the Red Book (CSIR, 2019) and Municipal Design Guidelines (Municipality, 2015), the proposed stormwater design will be based on restricting post-development peak flows to pre-development peak flows, for the same recurrence interval. The proposed stormwater design concept will comprise of smaller subdivided catchment areas conveying runoff generated from roads and erven

to grid inlets and ultimately into detention ponds via the stormwater network. Attenuation of the difference between the pre- and post-development peak flows will be accommodated in the two detention ponds. Catchment 1 (eastern catchment) will drain to detention pond 1 which has a volume capacity of 240m³. The area north of pond 1, is lower laying and will not be able to drain to pond 1. Instead, this area will drain to the north and connect to the existing system in Tolbos road. Pond 1 will have a variable outlet system only allowing pre-development flow rates out into the existing system connected in Hendrikse Road. Catchment 2 (western catchment) will drain to detention pond 2 which has a volume capacity of 410m³. Pond 2 will have a variable outlet system only allowing pre-development flow rates out into the existing system via the headwall in the northern corner of the site. Figure 6 illustrates the proposed stormwater network and catchment areas.



Figure 6: Proposed post-development stormwater network

The post-development stormwater runoff for various storm-events were also calculated using the rational method. For the post-development scenario, the site is considered to be developed as per the proposed sub-division plan, in Appendix A and all areas drain to detention pond 1 and detention pond two as shown in Figure 6.

The combined post-development run-off for 1:2, 1:5, 1:10, 1:20 and 1:50 years recurrence intervals for the development as calculated above is shown in Table 5.

Table 5: Combined post-development calculated peak flows

Recurrence Interval (1: _years)	Peak flows		
	Pre-development (m ³ /s) Greenfield	Combined Post- development (m ³ /s) (flow into detention ponds)	Combined Post- development (m ³ /s) (outlet into the existing system)
2	0.063	0.234	0.063
5	0.092	0.394	0.092
10	0.120	0.516	0.120
20	0.155	0.638	0.155
50	0.230	0.798	0.230
100	0.236	0.920	0.236

8 ROADS

8.1 Access

A Traffic Impact Assessment (TIA) was conducted by Zutari that is attached to this report in Appendix B. Access to the Development will be via the extension of the existing road network. The layout of the roads will be done in accordance with the Guidelines for Human Settlement Planning and Design (commonly known as the Red Book) and the Stellenbosch Zoning Scheme. Bulk external road upgrades required will be implemented as per the findings of the TIA.

8.2 Internal roads

The internal road network will have a paved surface as per town planner's details. All civil services will be within the 13.5m to 8m road reserves.

Emphasis will be placed on traffic calming and low speeds by implementing an appropriate geometric road design philosophy. The roads shall have a 2.5% cross fall towards a paved stormwater channel.

Emergency services such as firefighting services and waste removal vehicles would be supplied by the Municipality. All roads will be designed and constructed to accommodate light vehicles as well as occasional usage by heavy vehicles such as fire trucks or delivery trucks.

8.3 Parking Facilities

Visitor and general parking areas will be provided along roads within the development as indicated in the TIA. Parking on the erven will be specified by the town planner as required for each house type.

9 Electrical Services

De Villiers and Moore (Pty) Ltd was appointed to investigate on the capacity availability in the existing system as well as electrical supply required for the proposed development. De Villiers and Moore reported that there is sufficient capacity in the existing system to accommodate the proposed development.

The provisional load-calculations indicate that 2 x miniature substations will be required to supply the calculated low-voltage load. The exact positions cannot be fixed now but will be in the vicinity of the 2 x blue blocks included on the drawing in Figure 7.

The minisubs will not require separate erven to be registered. We indicated one in the remaining POS-area, and the other in the water-reservoir area (can also be moved to the road-reserve outside the reservoir area). Each minisub position will be 6x4m dedicated for the minisub. Refer to Appendix C for the full report.



Figure 7: Proposed electrical mini substation positions

10 Solid Waste Disposal

All waste generated from the residential units of the proposed development, will be temporarily stored in storage bins. The municipality will collect all bins from an appropriate refuse areas or individual erven on the transport it to a Waste Disposal Site as determined by the Municipality. The position of the refuse areas (if applicable) will be placed at a practical area with easy access for the Municipal Solid Waste Disposal Trucks of the Municipality. No access control will be used in the development. Stellenbosch Municipality has sufficient capacity available for the development.

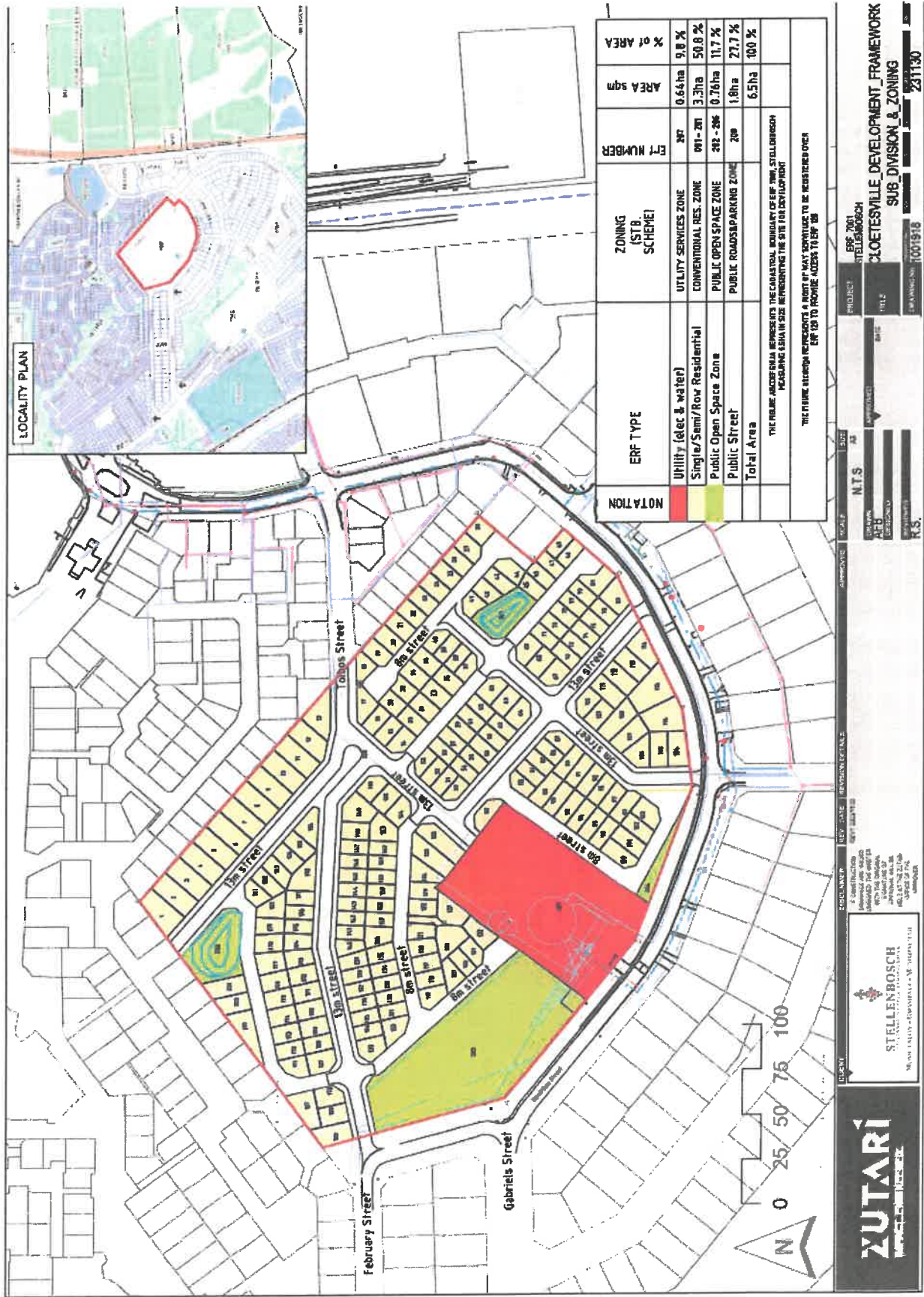
11 Conclusion

No major issues are foreseen for the proposed development in terms of engineering services. Ample capacity is available for all civil services, given proposed upgrades are facilitated ahead of construction. Detail design will identify and address all other minor issues such as exact connection points and other construction details.

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Appendix A: Subdivision and Zoning Plan



Appendix B: Traffic Impact Assessment

Appendix C: Electrical Services Report

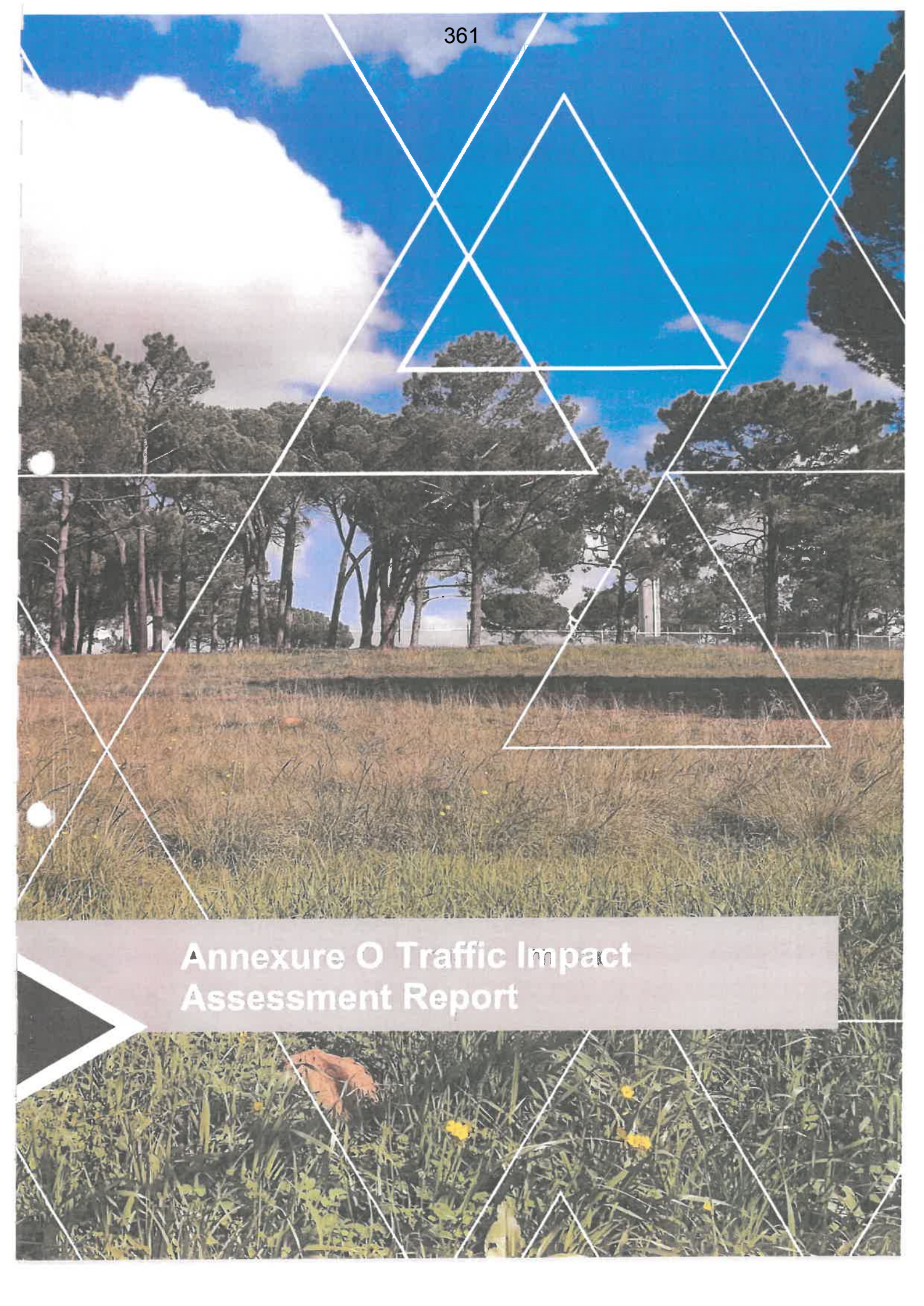
In diversity there is beauty
and there is strength.

MAYA ANGELOU

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Annexure O Traffic Impact Assessment Report

Traffic Impact Assessment

Broad Conceptual Urban Design Framework for Erf 7001, Cloetesville

Stellenbosch Municipality

Submission date: 2024/06/11

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Author signature		Approver signature	
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Contents

1 Introduction.....	5
1.1 Context and Purpose.....	5
1.2 Scope of Assessment.....	5
2 Study Area.....	6
2.1 Locality	6
2.2 Affected Roads	6
3 Traffic Impact Analysis	7
3.1 Intersections and Traffic Counts.....	7
3.2 Existing Traffic	8
3.2.1 Intersection Analysis.....	8
3.2.2 Discussion	9
3.3 Impact of Previous Developments.....	14
3.4 Development Traffic	15
3.4.1 Trip Generation.....	15
3.4.2 Trip Distribution	16
3.5 2026 Background Traffic (Escalated Existing + Previously Planned Development)...	18
3.5.1 Mitigation Measures	20
3.6 2026 Total Traffic (Escalated Existing + All Developments)	22
3.6.1 Mitigation Measures	23
3.7 2031 Future Traffic (Escalated Existing + All Developments).....	25
3.7.1 Mitigation Measures	27
4 Access Management.....	28
5 NMT and Public Transport.....	28
6 Conclusions.....	29
7 Recommendations	30

Appendices

Traffic Counts

SIDRA Analysis Existing Traffic

SIDRA Analysis 2026 Background Traffic

SIDRA Analysis 2026 Total Traffic

SIDRA Analysis Future 2031 Traffic

Figures

Figure 1: Locality Plan of Cloetessville

Figure 2: Key Intersections

Figure 3: Intersection 1: R44 / Hendrikse Road AM and PM LOS Upgraded

Figure 4: Intersection 1: R44 / Hendrikse Road AM and PM LOS for Additional Upgrades

Figure 5: Intersection 7: R304 / Welgevonden Boulevard AM and PM LOS

- Figure 6: Intersection 8: R44 / Fir Street Average Vehicle Queue Length on Fir Street
- Figure 7: Intersection 8: R44 / Fir Street AM and PM LOS Converted to Signalised Intersection
- Figure 8: Previous Developments
- Figure 9: Global Trip Distribution
- Figure 10: Global Trip Distribution
- Figure 11: Intersection 1: R44 / Hendrikse intersection AM and PM LOS 2026 Background Traffic
- Figure 12: Intersection 7: R304 / Welgevonden Boulevard intersection AM and PM LOS 2026 Background Traffic
- Figure 13: Intersection 1: R44 / Hendrikse Road intersection AM and PM LOS dualled R44
- Figure 14: Upgraded Intersection 7: R304 / Welgevonden Boulevard Intersection
- Figure 15: Upgraded Intersection 7: R304 / Welgevonden Boulevard - AM and PM LOS
- Figure 16: Extension of short lane on Hendrikse Road.
- Figure 17: Intersection 1: R44 / Hendrikse Road Intersection AM and PM LOS dualled R44 with extended short lane on Hendrikse Road
- Figure 18: Intersection 2: Hendrikse Road / Tolbos Road Conversion affect 2026 Background Traffic plus All Developments
- Figure 19: Intersection 5: Lang Road / Gabriels Road Conversion affect 2026 Background Traffic plus All Developments
- Figure 20: Intersection 1: R44 / Hendrikse Road - AM and PM LOS future 2031 Traffic Conditions
- Figure 21: Intersection 2: Hendrikse Road / Tolbos Road Conversion affect future 2031 Traffic Conditions
- Figure 22: Intersection 5: Lang Road / Gabriels Road Converted affect during AM Peak hour future 2031 Traffic Conditions
- Figure 23: Proposed PT and NMT Expansion

Tables

- Table 1: Existing Intersection Analysis
- Table 2: Previous Development Trips
- Table 3: Development Trip Generation (Unadjusted)
- Table 4: AM and PM Distributions at R304/Welgevonden
- Table 5: AM and PM Distributions at R44/Hendrikse Road
- Table 6: 2026 Background Traffic plus Previous Developments Intersection Analyses
- Table 7: 2026 Total Traffic Intersection Analyses
- Table 8: 2031 Future Traffic Intersection Analyses

1 Introduction

1.1 Context and Purpose

Stellenbosch Municipality identified a need for integrated urban settlement developments to address municipal housing backlogs. The municipality has therefore undertaken the Broad Conceptual Urban Design Framework for Erf 7001, Stellenbosch to obtain town planning and development rights. As part of the feasibility study for possible housing, a basic transport/traffic status quo report was conducted in 2022. The current stage of the project requires a full Traffic Impact Assessment (TIA) in terms of the South African Traffic Impact Assessment Manual (TMH 16).

1.2 Scope of Assessment

The scope of this report encompasses quantifying the impacts of the proposed development of Erf 7001 only. There are currently other developments in and around the Cloeteville area, which were accounted for in this assessment.

The site is currently undeveloped, sloped and consist of palm trees. The proposed *development* will be infill housing for the suburb of Cloeteville that will consist of 204 single residential units with the associated roads to tie into the existing road network. The scope of the TIA includes the estimation of the trips that will be generated by developing the land. Identifying, modelling as well as discussing the impact that the additional trips will have on the road network. Each intersection will be modelled for the following four scenarios:

- Existing Background Traffic volumes (2022 and 2024);
- Escalated Background Traffic volumes plus Previously Planned Development Traffic (2026);
- Escalated Background Traffic volumes plus All Development Traffic, including Cloeteville (2026);
- Future Traffic volumes 5 Years after Development has been completed (2031); and
- Analysis of any mitigation measures for poor levels of service (e.g., existing intersections, under different lane configurations or signal phasing and/or intersection upgrades).

As the development will form part of an existing neighbourhood and class 5 road network, much of the focus of the intersection modelling is placed on the intersections at the R304 and the R44.

Further considerations will include Public Transport (PT), access routes, Non-Motorised Transport (NMT) and pedestrian activity.

2 Study Area

2.1 Locality

Cloetesville is a suburb of Stellenbosch and is located just north of the Stellenbosch CBD. It is "wedged" between the R304 (Bird Street) and the R44 (Adam Tas Street). The R304 provides access to Bottelary Road and the N1 to the North. The R44 provides access to Somerset West and the N2 to the South. Erf 7001 is located within Cloetesville and directly south of Welgevonden Estate. The locality of the proposed development site is shown in Figure 1.

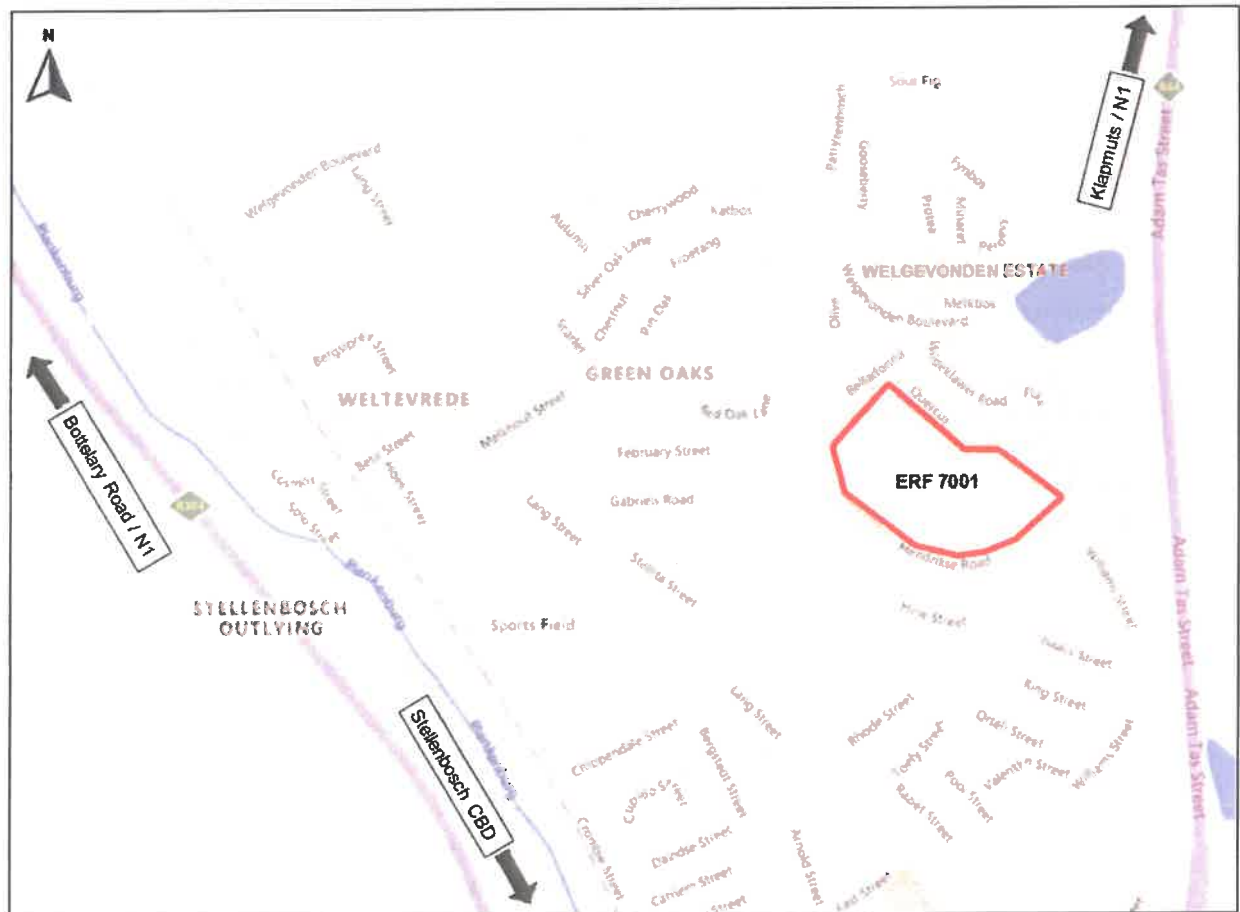


Figure 1: Locality Plan of Cloetesville

2.2 Affected Roads

The primary concern is the impact that the additional housing bulk will have on the R304 and the R44 in Stellenbosch. The other impacted roads are standard Class 5 Local streets, and the development of the site will itself introduce additional roads to the road network.

- R304 is classified as a Class 2 Primary Arterial, it is one lane per direction, with turning lanes at intersections, paved shoulders and sidewalks along Kayamandi.
- R44 is classified as a Class 2 Primary Arterial, it is dualled from Stellenbosch and becomes one lane per direction further north, with turning lanes at intersections, paved shoulders and sidewalks along the roadway from Stellenbosch to Hendrikse Road. The road also allows for the North-South connectivity, Stellenbosch to the South with Wellington to the North.

- R304 and R44, Langstraat Suid Road are the only 3 signalised access roads into Cloeteville. The majority of all vehicle trips use one of these three access roads. The location of the site is in the north of Cloeteville so it is reasonable to assume that the development traffic will be attracted to the R304 and the R44 as access roads, especially in the AM peak. In the PM peak it can be expected that vehicles trips will enter Cloeteville from the south via Langstraat Suid Road.
- It is assumed that access may be onto Hendrikse Road in the South; or February Road in the East; or Tolbos Road in the North. Hendrikse Road functions as a distributor as it connects to the R44 and the other two roads are class 5 residential streets, approximately 6 to 7m wide and with sidewalks only along the north of Hendrikse Road. Traffic calming facilities are also provided along Hendrikse Road.
- There is a downward slope to the south, towards Hendrikse Road. An excessive gradient is often problematic for 4-way stop controlled intersections. SARTSM recommends that all-way stop control not be used on roads with a gradient greater than 8%. Careful consideration must be given to the new intersections that will be created by the developments access roads.
- The future “access” roads are likely to be off Hendrikse Road which functions as a Collector/Distributor for this portion of Cloeteville. Hendrikse Road accesses the R44 in the North and access into Stellenbosch in the North. It is therefore expected that Hendrikse Road will carry large volumes of traffic.

3 Traffic Impact Analysis

3.1 Intersections and Traffic Counts

The key intersections, shown in Figure 2, were identified in the Status Quo Report as requiring modelling and analysis. Based on the access arrangements for the Cloeteville community the intersections at the R304 and the R44 are the most critical in terms of analyses. These two high order roads are also important arterials in the greater road network the region and any impacts to them must be carefully considered.

Peak hour traffic counts were conducted in August 2022 and June 2024 for the full day by Nick Venter Traffic Surveying. The peak hour traffic counts that were used in the modelling are included as Appendix A of this report. The proposed development will consist of residential units only and will therefore mostly generate vehicle trips during weekday morning and evening peak hours.

Counts were undertaken at these intersections (also shown in Figure 2):

- **Intersection 1:** R44 / Hendrikse Road (*Traffic Control Signal*) – *Currently being upgraded*
- **Intersection 2:** Hendrikse Road / Tolbos Road (*All-Way Stop*)
- **Intersection 3:** Hendrikse Road / Williams Road (*All-Way Stop*)
- **Intersection 4:** Hendrikse Road / Rhode Street (*Priority Yield*)
- **Intersection 5:** Lang Road / Gabriels Road (*All-Way Stop*)
- **Intersection 6:** Lang Road / Welgevonden Blvd (*Priority Stop*)
- **Intersection 7:** R304 / Welgevonden Blvd (*Traffic Control Signal*)
- **Intersection 8:** R44 / Fir Street (*Priority Stop*) – Counted in June 2024



Figure 2: Key Intersections

3.2 Existing Traffic

3.2.1 Intersection Analysis

The impact on capacity and intersection operation was analysed using SIDRA Intersection modelling software. The intersections were modelled individually and not as a network. The modelling outputs that were considered and included in this report are:

- Level of Service (LOS) from A to F.
- Average Delay per Vehicle (seconds).
- Degree of Saturation (v/c ratio).

The results of the SIDRA modelling are summarized in Table 1 below and included as Appendix B. The existing traffic operations are based on existing intersection geometries, lane configuration and controls. Based on the results of these capacity analyses, there are already serious congestion concerns at the R44 / Fir Street intersection. Vehicles turning right from these minor approach onto the R44 experience long delays as they are waiting for an available gap to enter the R44 traffic safely. This in turn delays the vehicles who want to turn left onto the R44, who require smaller gaps, to wait longer due to only having one approach lane.

The R44/Hendrikse Road intersection was found to operate at an unacceptable LOS for the AM peak hour. Upgrades to the intersection is currently underway. The impact of these upgrades will be discussed in Section 3.2.2.

Table 1: Existing Intersection Analysis

No.	Intersection Name	Peak Period	Delay (sec)	V/C Ratio	Overall LOS	Approach Leg Level of Service			
						South	East	North	West
1	R44 / Hendrikse Road	AM	129.3	1.08	F	E	-	F	F
	Traffic Signal	PM	16.6	0.76	B	B	-	A	E
2	Hendrikse Road / Tolbos Road	AM	14.5	0.28	B	B	B	B	E
	All-way stop	PM	26.4	1.00	D	B	B	C	F
3	Hendrikse Road / Williams Road	AM	13.6	0.21	B	C	B	-	B
	All-way stop	PM	13.2	0.24	B	C	B	-	B
4	Hendrikse Road / Rhode Street	AM	1.1	0.07	A	A	A	-	A
	Yield on southern side	PM	1.7	0.06	A	A	A	-	A
5	Lang Road / Gabriels Road	AM	12.6	0.56	B	B	C	B	-
	All-way stop	PM	10.0	0.28	B	A	C	A	-
6	Lang Road / Welgevonden	AM	5.4	0.31	A	A	A	-	A
	Stop on southern side	PM	5.2	0.17	A	A	A	-	A
7	R304 / Welgevonden Blvd	AM	18.4	0.76	B	B	D	B	-
	Traffic Signal	PM	22.9	0.83	C	C	E	A	-
8	R44 / Fir Street	AM	2560.5	39.2	F	A	-	A	F
	Stop on western side	PM	156.1	8.5	F	A	-	A	F

3.2.2 Discussion

Intersection 1 R44 / Hendrikse Road: All the approaches on R44 and Hendrikse Road intersection experiences severe delays in the AM peak hour under the **existing** traffic conditions and consequently the overall LOS for the intersection is LOS F. The upgrade to the intersection is provided in Appendix C.

The impact of the intersection upgrades (currently underway) is shown in Figure 3. SIDRA's optimised signalised setting was used with a maximum cycle time of 120 seconds. The upgrades proposed provide little improvements to the performance of the intersection during the AM peak hour. The greatest issue is the shear amount of traffic turning right from Hendrikse Road. There are over 800 vehicles turning right in the AM peak hour. Erf 7001 is less than 500m from this intersection. Given existing traffic patterns, the development of the site will likely contribute to the congestion at the R44 x Hendrikse Intersection especially as annual traffic continue to grow.

Figure 4 shows the impact of additional upgrades to the R44 / Hendrikse Road intersection and its impact on the performance of the intersection. The only additional changes to the upgrades currently underway include, adding an additional right turn movement on Hendrikse Road and make the right turn lane a through movement lane as well on the southern approach of the R44. The SIDRA results show the one turning lane still operates under LOS F conditions, however overall, the intersection operates under acceptable LOS D conditions during the AM peak hour. This layout will be used for the remaining testing scenarios.

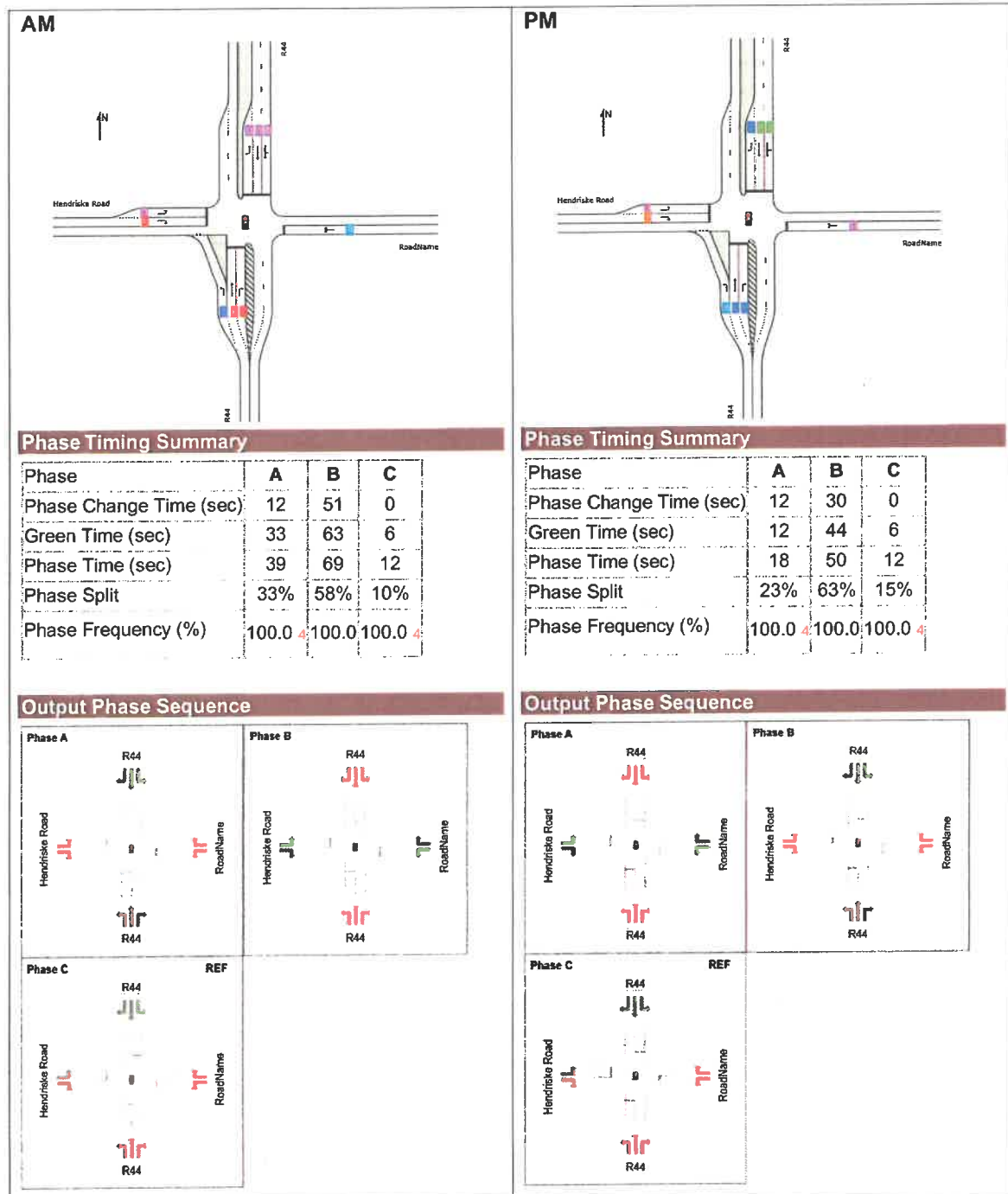


Figure 3: Intersection 1: R44 / Hendrikse Road AM and PM LOS Upgraded

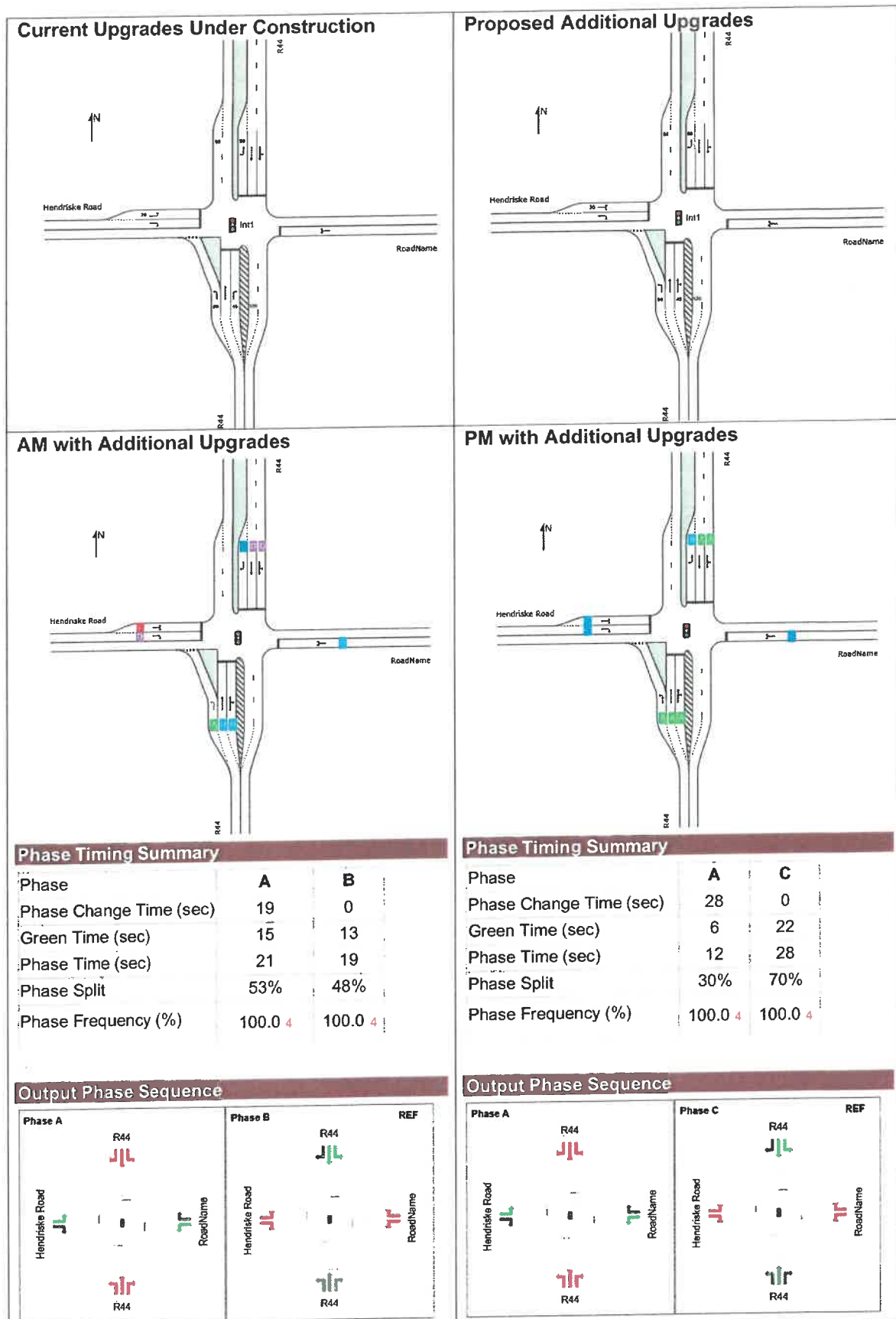


Figure 4: Intersection 1: R44 / Hendrikse Road AM and PM LOS for Additional Upgrades

Intersection 7 R304 / Welgevonden Blvd: The minor road approaches experience large delays (and poor LOS) under existing traffic conditions for PM peak hours as shown in Figure 4. The modelling results show that all movements along the major roads experience average delays but do not affect the LOS of all movements on R304. This is likely because green time is prioritised for traffic on the R304 as it is one of the main arterial roads to Stellenbosch. Should the LOS become completely unsatisfactory, a mitigation measure will be proposed to improve the LOS for failing legs.

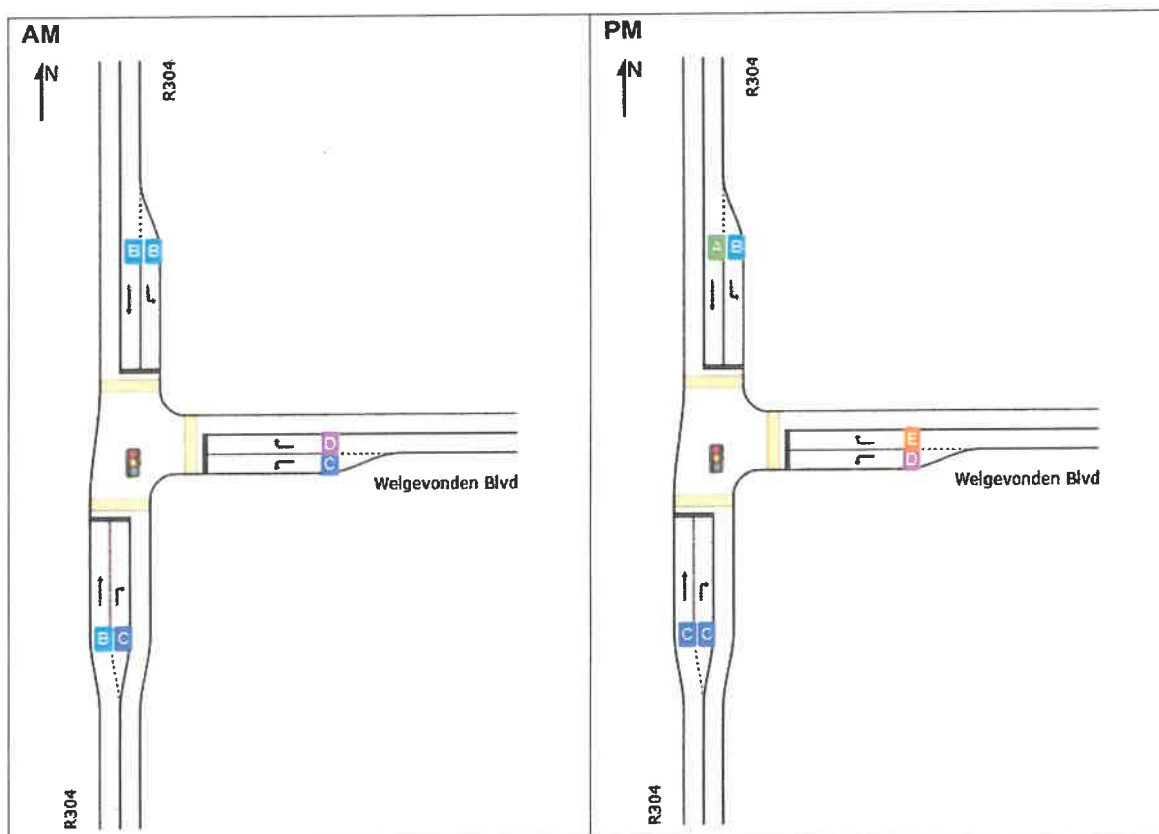


Figure 5: Intersection 7: R304 / Welgevonden Boulevard AM and PM LOS

Intersections 2 – 6: All the residential intersection operate at acceptable LOS. This is due to low traffic volumes and the minimal overall delay experienced at the intersections that are all-way stop or priority stop controlled. It should be noted that all-way stop control intersection operate best when the traffic on all approaches is “balanced”, thus distributing the delay equitably and improving LOS. After the development traffic is added to the local road network the *balance* on these intersections may change.

Intersection 8: Operates at unacceptable LOS conditions during the AM and PM peak hours. With the minor approach experiencing major delays. To mitigate the poor performance at this intersection, it is proposed to convert this intersection into a signalised intersection.

According to the South African Road Traffic Signs Manual (SARTSM) Volume 3 Traffic Signal Design, the installation of a traffic signal is deemed warranted at an intersection when ANY one of the following three queue length warrants are met:

- **WARRANT 1:** The average length of ANY individual queue equals or exceeds four (4) over any one hour of a normal day.
- **WARRANT 2:** The SUM of the average lengths of all queues equals or exceeds six (6) over any one hour of a normal day.

- **WARRANT 3:** The SUM of the average lengths of all queues equals or exceeds four (4) over each of any eight hours of a normal day (the hours do not have to be consecutive, but they may not overlap).

Figure 6 shows the average vehicle queue lengths that formed on Fir Street. During the AM peak hour 63 vehicles queue on Fir Street and during the PM peak hour 16 vehicles queue on Fir Street. From the SIDRA results it is clear that the R44 / Fir Street intersection warrants a traffic signal according to WARRANT 1 of the SARTSM guidelines.

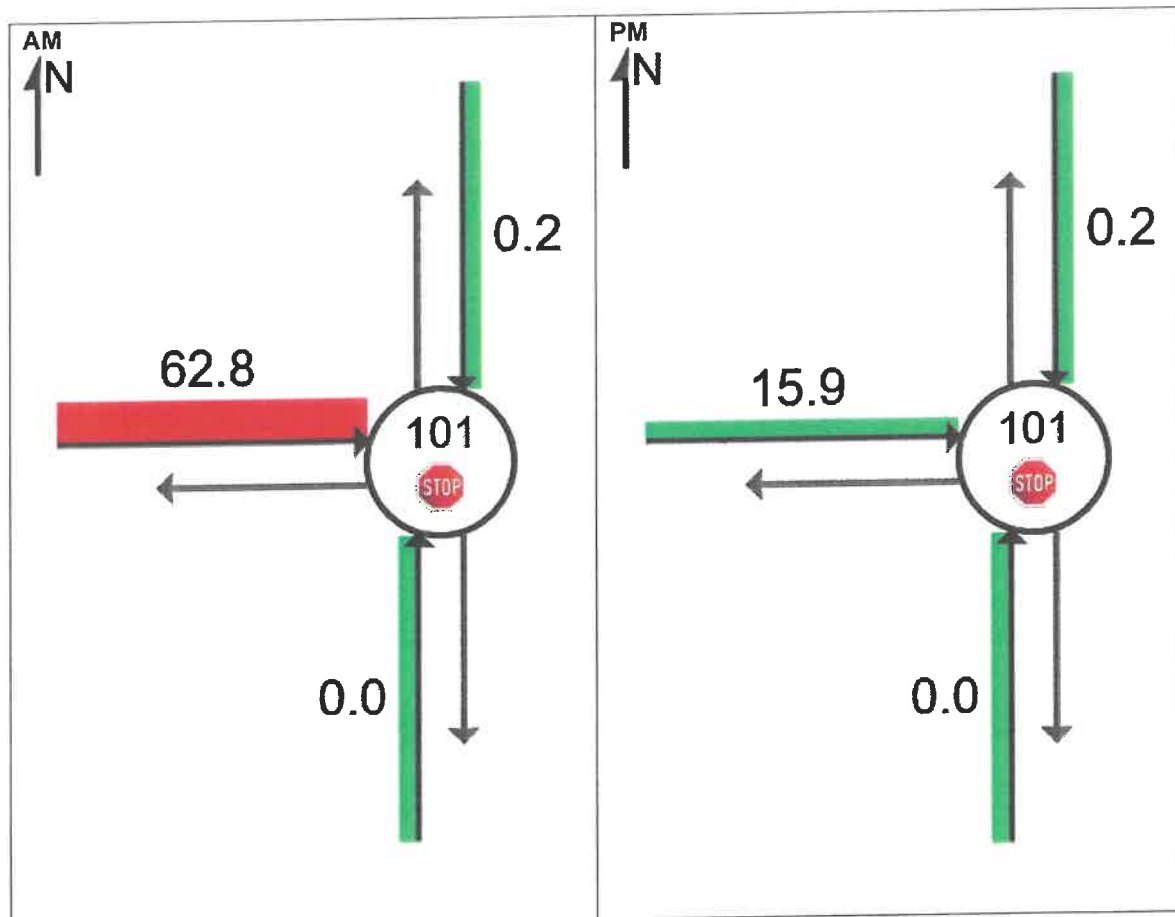


Figure 6: Intersection 8: R44 / Fir Street Average Vehicle Queue Length on Fir Street

During the traffic count survey, it was observed that a significant queue of vehicles formed on Fir Street at the R44 / Fir Street intersection. Approximately, 40 vehicles or more during the AM peak hour. The field observations thus confirm what was found from the SIDRA results, that this intersection warrants a traffic signal according to WARRANT 1 of the SARTSM guidelines.

SIDRA's optimised signal setting was used with a maximum cycle time of 120 seconds for the signal phasing. Further investigation into the conversion of this intersection may be required, specifically looking at the entire corridor of the R44, from the R44 / Langstraat Suid Road to the R44 / Voliere Access intersections.

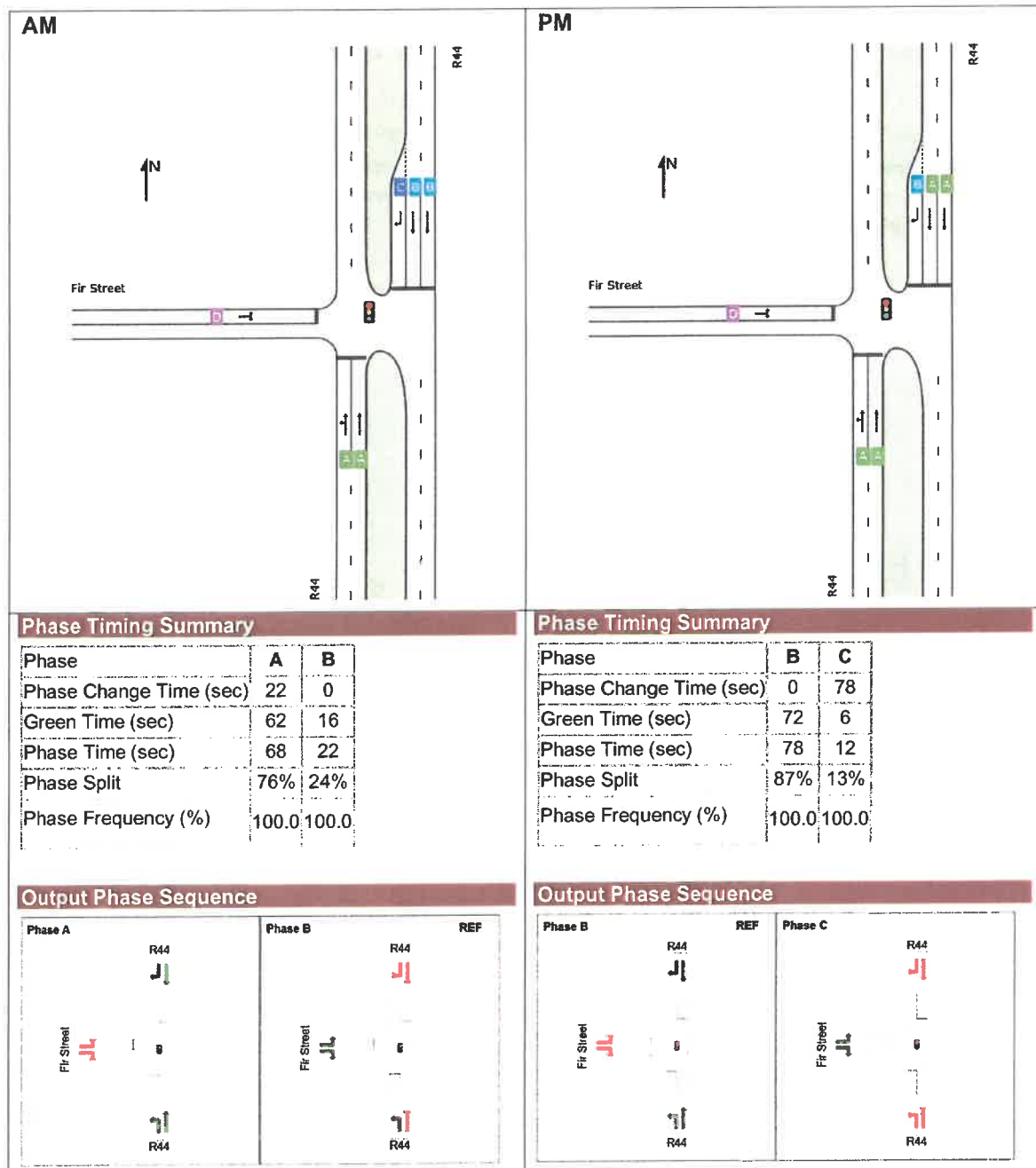


Figure 7: Intersection 8: R44 / Fir Street AM and PM LOS Converted to Signalised Intersection

3.3 Impact of Previous Developments

At the time of preparing this TIA, three other developments had submitted TIAs to the Stellenbosch Municipality for approval and one development is currently being planned. It was therefore necessary to take trips to/from these developments into account and consider the overall impact on the road network. The four developments that will be considered in this TIA are listed below:

- ▶ Oakhills Estate Stellenbosch – Construction in progress
- ▶ Farm 81/33 Newinbosch – Construction in progress
- ▶ Erf 7001 Voliere - Construction in progress
- ▶ Kayamandi Northern Extension – Planning in progress

Table 2 shows the number trips each development will generate, as determined by their respective TIAs. As shown, a total of 3 908 trips (1 504 IN and 2 404 OUT) will be generated in the AM peak and

3 398 trips (2 133 IN and 1 265 OUT) will be generated in the PM peak hour. Figure 8 shows the locations of these developments.

Table 2: Previous Development Trips

Development	AM		PM	
	In	Out	In	Out
Oakhills Estate	47	142	132	57
Newinbosch	986	1 411	1 261	785
Voliere	52	154	144	62
Kayamandi Northern Extension	419	697	596	361
Total	1 504	2 404	2 133	1 265

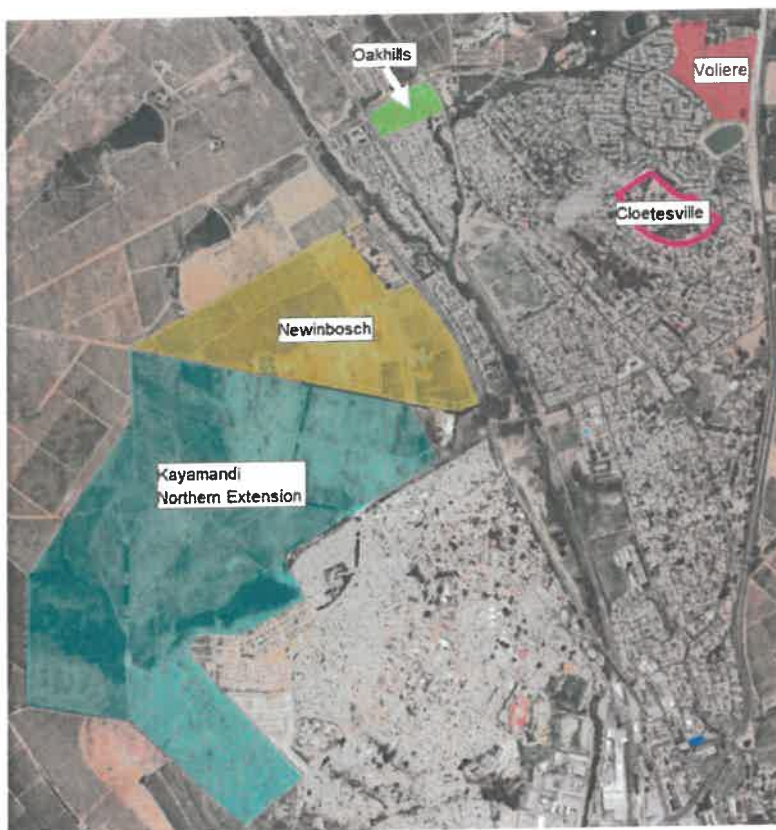


Figure 8: Previous Developments

3.4 Development Traffic

3.4.1 Trip Generation

TMH17 South African Trip Data Manual was used to estimate the number of peak hour trips. Since the development site is purely residential, Land Use code 200 was applicable, and weekday peak hour traffic volumes are considered. The trip generation rate and the in/out split that were used to estimate the traffic are shown below. And the estimated trips are summarised in Table 3.

Land Use: Residential (Code 200)	AM peak	PM peak
• 210: Single Dwelling Units	1.0 / Unit	1.0 / Unit
• In / Out Split (%)	25:75	70:30

Table 3: Development Trip Generation (Unadjusted)

Land Use Type	Number	Trips	AM		PM	
			In	Out	In	Out
Single Residential	204	204	51	153	143	61
Total Trips		204	51	153	143	61

Trip Generation assumes a motorised vehicle trip; therefore, the typical trip rates are applicable to areas with high vehicle ownership and low public transport usage/availability. TMH17 therefore recommends trip reduction factors for developments and areas where the typical trip rate would not apply. Trip generation may be reduced based on a Mixed-use Development, Vehicle Ownership and Transit Availability. In correspondence between Zutari and Stellenbosch Municipality, it has been agreed that none of the COTO trip reductions are applicable for this development.

3.4.2 Trip Distribution

It is assumed that the generated trips will distribute throughout Cloetesville the same as the existing traffic.

The nature of the development is simply additional dwelling units in an already established residential neighbourhood. It is envisioned that the socio-economic profile of the new residents will be similar or the same to the rest of Cloetesville. There is therefore no reason to expect the traffic patterns to be different. The existing traffic counts were used to estimate:

1. The global distribution i.e., the proportion of traffic that will use specific accesses to the neighbourhood;
2. The local distribution i.e., the proportion of traffic assigned to each movement at a particular intersection.

Despite there being 3 signalised access roads in the suburb, it was assumed that 100% of the development traffic will use either the R304 or the R44 as the primary access road for Cloetesville. Based on the existing traffic patterns the following estimations were made about the *Global* traffic distribution shown in Figure 9.

- 77% AM traffic will enter via R304 and 23% traffic will enter via R44,
22% AM traffic will exit via R304 and 78% will exit via R44.
- 33% PM traffic will enter via R304 and 67% traffic will enter via R44,
53% PM traffic will exit via R304 and 47% traffic will exit via R44.

Thereafter it is assumed all traffic will take the most direct path to the erf 7001.

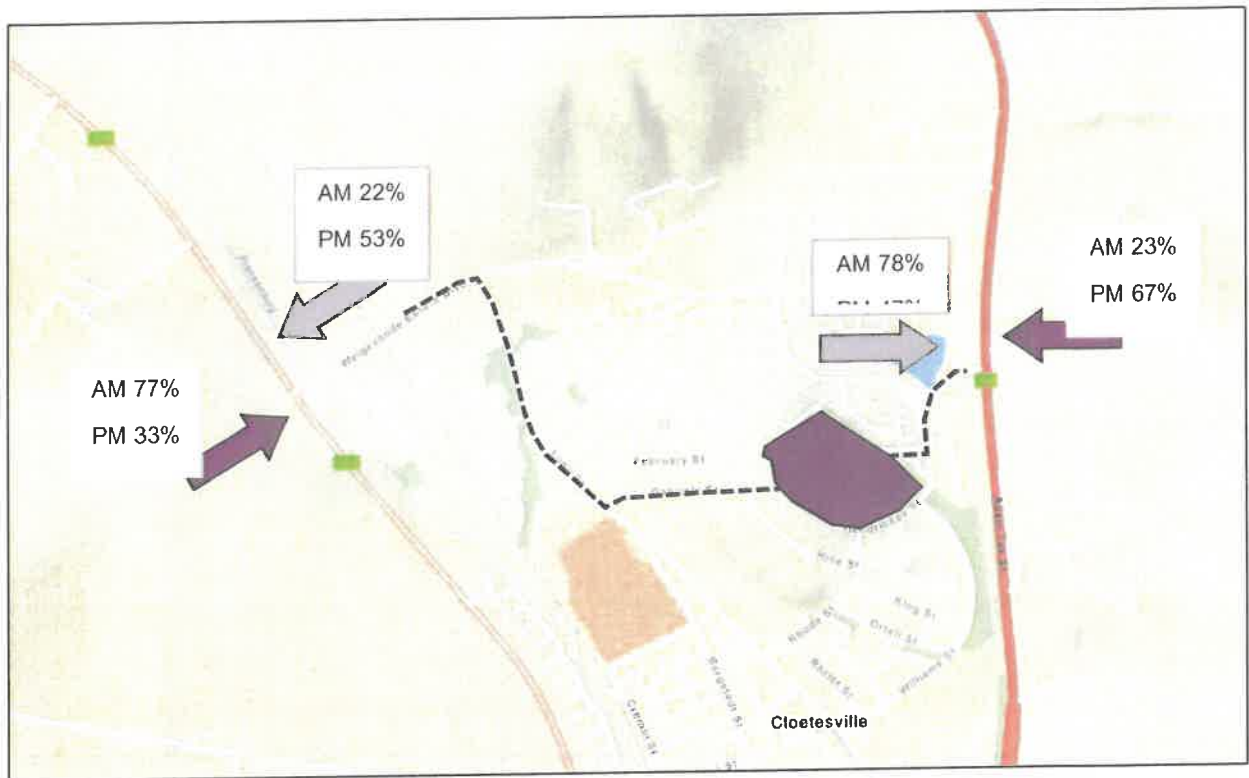


Figure 9: Global Trip Distribution

For the Local Distribution (i.e., the individual intersection movements)

- At the R304 x Welgevonden intersection

Table 4: AM and PM Distributions at R304/Welgevonden

AM Distribution	PM Distribution
South Bound, left turning: 67% North Bound, right turning: 33%	South Bound, left turning: 55% North Bound, right turning: 45%
West Bound, left turning: 28% West Bound, right turning: 72%	West Bound, left turning: 65% West Bound, right turning: 35%

- At the R44 x Hendrikse Intersection

Table 5: AM and PM Distributions at R44/Hendrikse Road

AM Distribution	PM Distribution
South Bound, right turning: 25% North Bound, left turning: 75%	South Bound, right turning: 19% North Bound, left turning: 81%
East Bound, left turning: 5% East Bound, right turning: 95%	East Bound, left turning: 26% East Bound, right turning: 74%

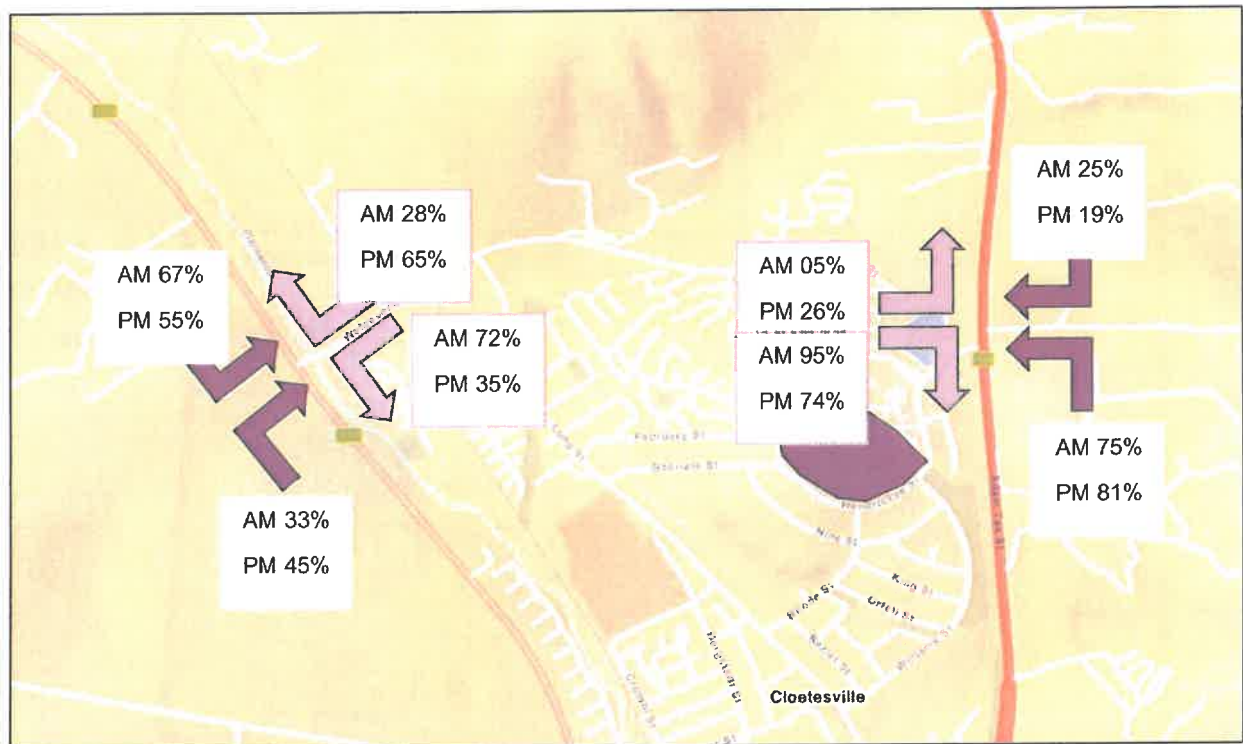


Figure 10: Global Trip Distribution

3.5 2026 Background Traffic (Escalated Existing + Previously Planned Development)

For the purpose of this TIA, it is assumed that the majority of the previously planned developments (Discussed in Section 3.3) will be completed by 2026. Thus, the total background traffic for 2026 was estimated by escalating the existing traffic conditions with a 2% growth rate over 4 or 2 years, depending on when traffic counts were conducted. Plus, the trips generated by the planned developments (Only Phase 1 of the Kayamandi Northern Extension). The results of modelling this scenario are summarised in Table 6, and included as Appendix D.

Based on the initial analyses results, the R304 / Welgevonden Boulevard and R44 / Hendrikse Road intersections were found to operate under unacceptable conditions. The poor performance of the R304 / Welgevonden Boulevard intersection is due to the growth in background traffic and the introduction of the Newinbosch development, that is assumed to be completed by 2026. Similarly, the growth in background traffic with the introduction of the Voliere development causes the R44 / Hendrikse Road intersection to fail. Mitigation measures for these intersections will be proposed.

It is noted that the western leg of Intersection 2: Hendrikse Road / Tolbos Road experiences LOS F during the PM peak hour. However, according to the traffic counts only 1 vehicle was surveyed coming from the western leg. This is also not due to any of the introduced developments. The intersection operates at an overall acceptable LOS and is a minor intersection located in the residential area. Thus, this is not case for major concerns.

All other study intersections continue to operate at the acceptable LOS as with the existing traffic scenario.

Table 6: 2026 Background Traffic plus Previous Developments Intersection Analyses

No.	Intersection Name	Peak Period	Delay (sec)	V/C Ratio	Overall LOS	Approach Leg Level of Service			
						South	East	North	West
1	R44 / Hendrikse Road Traffic Signal	AM	142.4	1.28	F	B	B	F	F
		PM	9.8	0.66	A	A	C	A	C
2	Hendrikse Road / Tolbos Road All-way stop	AM	14.7	0.31	B	B	B	B	E
		PM	25.9	1	D	B	B	C	F
3	Hendrikse Road / Williams Road All-way stop	AM	13.8	0.23	B	C	B	-	B
		PM	13.4	0.26	B	C	B	-	B
4	Hendrikse Road / Rhode Street Yield on southern side	AM	1.1	0.07	A	A	A	-	A
		PM	1.7	0.06	A	A	A	-	A
5	Lang Road / Gabriels Road All-way stop	AM	15.7	0.74	C	B	C	C	-
		PM	10.5	0.39	B	B	C	B	-
6	Lang Road / Welgevonden Stop on southern side	AM	5.8	0.41	A	A	A	-	A
		PM	5.8	0.26	A	A	A	-	A
7	R304 / Welgevonden Blvd Traffic Signal	AM	180.4	1.45	F	F	F	F	-
		PM	138.0	1.48	F	F	F	C	-
8	R44 / Fir Street Traffic Signal	AM	17.0	0.86	B	A	-	B	E
		PM	4.9	0.61	A	A	-	A	D

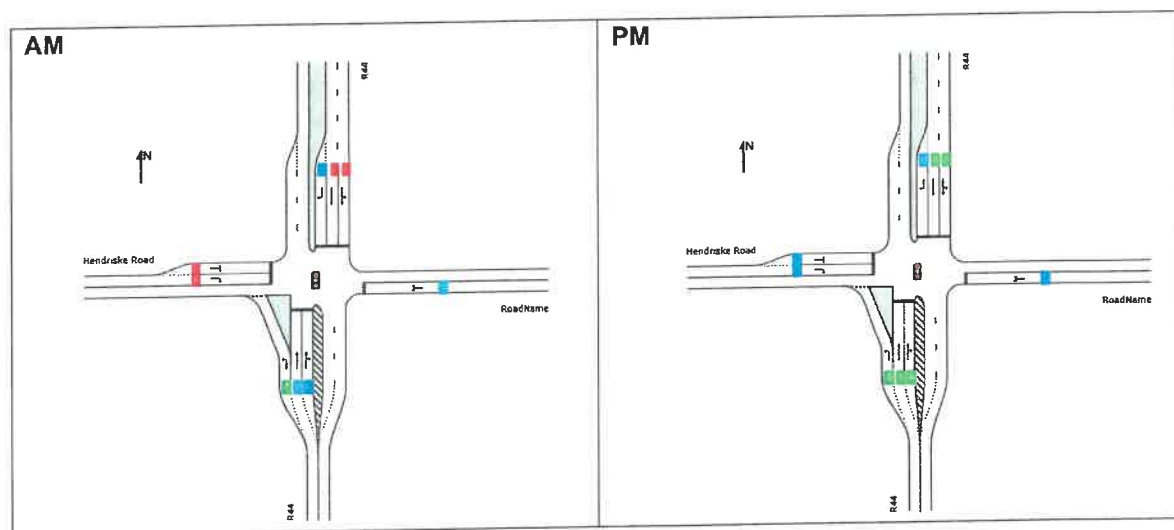


Figure 11: Intersection 1: R44 / Hendrikse intersection AM and PM LOS 2026 Background Traffic

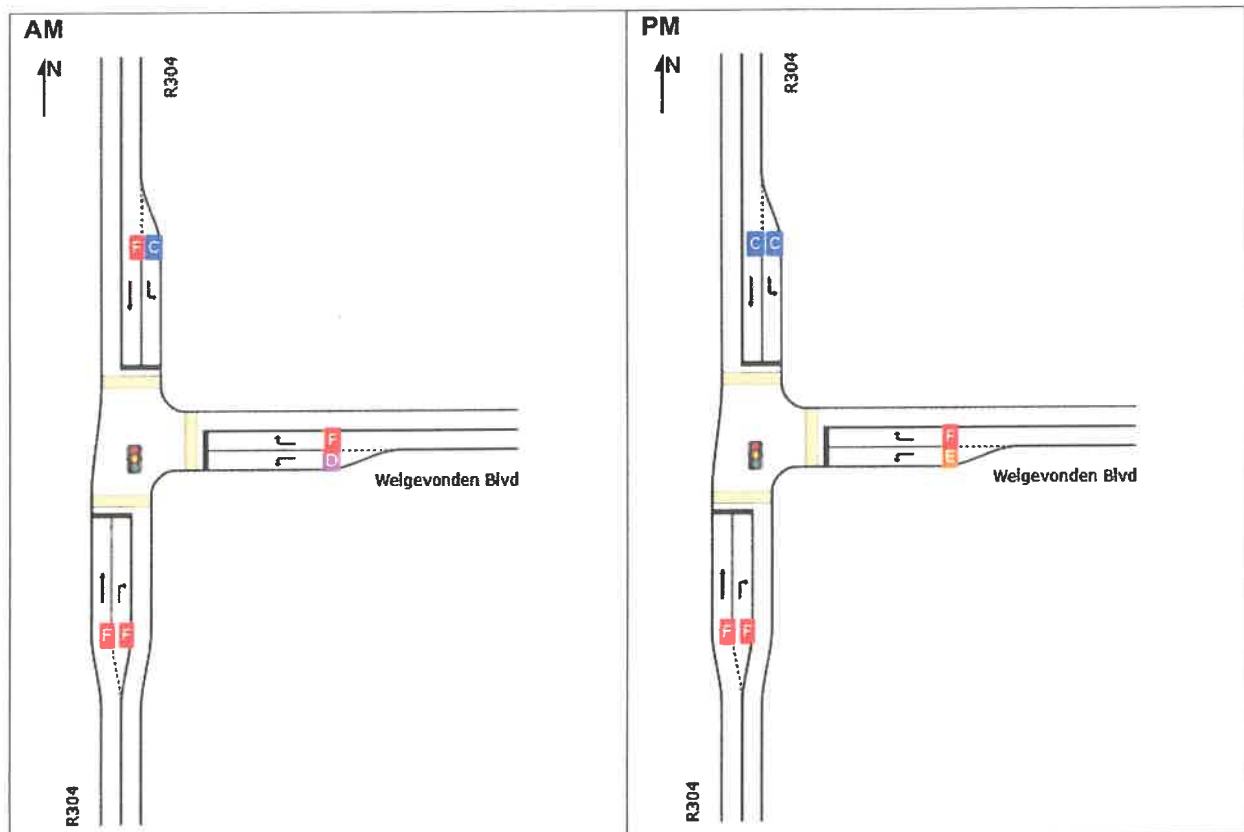


Figure 12: Intersection 7: R304 / Welgevonden Boulevard intersection AM and PM LOS 2026 Background Traffic

3.5.1 Mitigation Measures

The upgrade to Intersection 1: R44 / Hendrikse Road intersection is not sufficient with the growth in background traffic and the introduction of the previously planned developments. In addition to the upgrades proposed in Section 3.2.2, it may be necessary to dual the R44 between the R44 / Hendrikse Road and R44 / Fir Road intersection. The impact of the proposal is shown in Figure 13. Although the western approach still operates under LOS F conditions, the intersection overall operates under acceptable LOS E conditions during the AM peak hour.

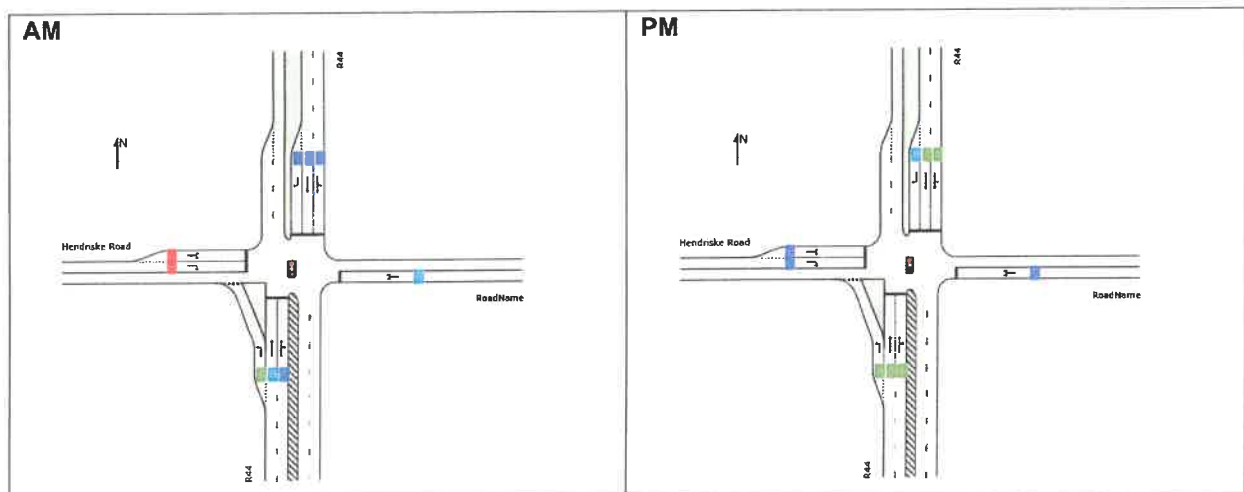


Figure 13: Intersection 1: R44 / Hendrikse Road intersection AM and PM LOS dualled R44

To address the poor performance of the R304 / Welgevonden Boulevard intersection it is proposed to upgrade the layout of the intersection as shown in Figure 14. As shown, it is proposed to dual the sections of the R304 approaching the R304 / Welgevonden Boulevard intersection. This is to accommodate the high background traffic volumes travelling on the R304 and the trips that are introduced by the Newinbosch development.

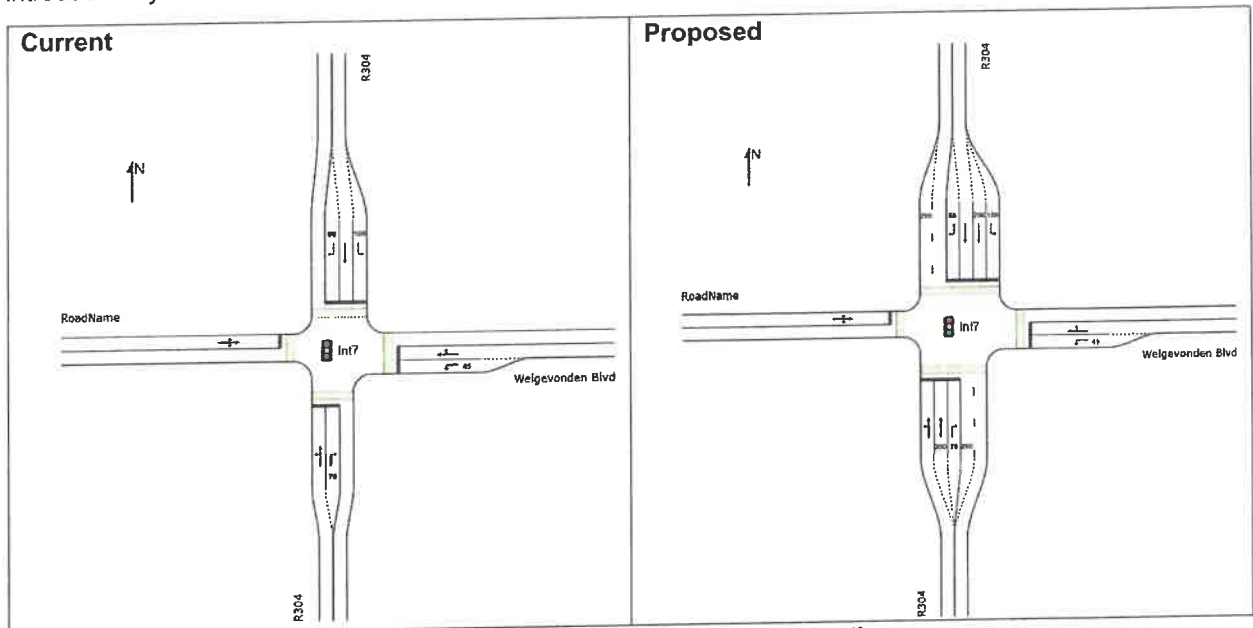


Figure 14: Upgraded Intersection 7: R304 / Welgevonden Boulevard Intersection

Figure 15 shows the LOS for the proposed upgrade R304 / Welgevonden Boulevard intersection. The dualling resulted in a significant improvement in the performance of the intersection. The western approach is not displayed in the figure below, since no traffic was observed using that approach during the traffic survey.

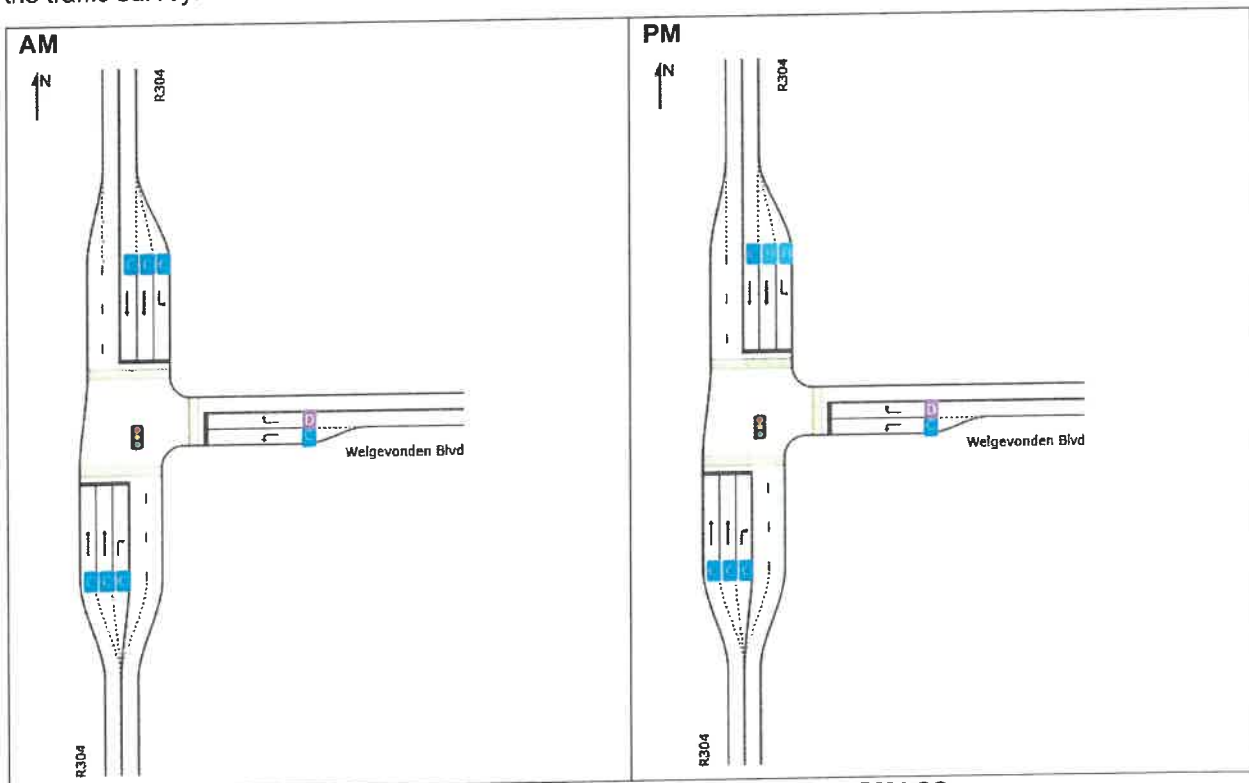


Figure 15: Upgraded Intersection 7: R304 / Welgevonden Boulevard - AM and PM LOS

3.6 2026 Total Traffic (Escalated Existing + All Developments)

For the purpose of this TIA, it is assumed that the Cloetesville development will also be completed by 2026. Thus, the total traffic for 2026 was estimated using:

- 1) The existing traffic conditions escalated with a 2% growth rate over 4 or 2 years, depending on when traffic counts were conducted.
- 2) The trips generated by the planned developments (Only Phase 1 of the Kayamandi Northern Extension) and the trips generated by the Cloetesville development.

The results of modelling this scenario are summarised in Table 7 and included as Appendix E.

Intersection 1: R44 / Hendrikse Road intersection was found to operate under unacceptable conditions during the AM Peak hour. As expected, this is due to the introduction of the Cloetesville development. Mitigation measures will be proposed.

It is noted that when the Cloetesville development traffic is added to the network, Hendrikse Road / Tolbos Road intersection operates at an overall acceptable LOS. However, the western leg of Intersection 2 experiences LOS F during the AM and PM peak hour. This is a minor intersection located in a residential area. The poor LOS is a result of the imbalance of the traffic volumes on each leg. Being a minor approach, this is not cause for concerns. However, the effect of converting this intersection into a stop control or priority control on just Tolbos Road approaches is shown in Figure 18.

The northern approach of Intersection 5: Lang Road / Gabriels Road was found to operate under LOS F conditions during the AM peak hour. But overall, the intersection operates under acceptable LOS E conditions. This intersection is not a major concern at the moment. This intersection could also potentially be converted to only have a priority control or stop control on Gabriels Road. The affects are shown in Figure 19

All other study intersections will continue to operate at acceptable LOS as with the 2026 background traffic plus all development traffic scenario.

Table 7: 2026 Total Traffic Intersection Analyses

No.	Intersection Name	Peak Period	Delay (sec)	V/C Ratio	Overall LOS	Approach Leg Level of Service			
						South	East	North	West
1	R44 / Hendrikse Road Traffic Signal	AM	109.5	1.21	F	C	B	D	F
		PM	9.5	0.65	A	A	C	A	C
2	Hendrikse Road / Tolbos Road All-way stop	AM	18.0	0.51	C	B	B	B	F
		PM	31.5	1.00	D	B	B	B	F
3	Hendrikse Road / Williams Road All-way stop	AM	14.0	0.31	B	C	B	-	B
		PM	13.7	0.32	B	C	B	-	B
4	Hendrikse Road / Rhode Street Yield on southern side	AM	2.3	0.09	A	A	A	A	A
		PM	2.8	0.08	A	A	A	A	A
5	Lang Road / Gabriels Road All-way stop	AM	41.1	0.97	E	B	C	F	-
		PM	16.8	0.60	C	C	C	C	-
6	Lang Road / Welgevonden Stop on southern side	AM	5.9	0.43	A	A	A	-	A
		PM	5.8	0.28	A	A	A	-	A
7	R304 / Welgevonden Blvd	AM	26.1	0.73	C	C	D	C	-

No.	Intersection Name	Peak Period	Delay (sec)	V/C Ratio	Overall LOS	Approach Leg Level of Service			
						South	East	North	West
	Traffic Signal	PM	26.4	0.78	C	C	C	B	-
8	R44 / Fir Street	AM	17.0	0.86	B	A	-	B	E
	Traffic Signal	PM	4.9	0.61	A	A	-	A	D

3.6.1 Mitigation Measures

Further upgrades to Intersection 1: R44 / Hendrikse Road intersection is required to accommodate the additional trips introduced by the Cloeteville development. It is further proposed to extend the short lane on Hendrikse Road as shown in Figure 16. It is showed on the old intersection layout, but it is only for illustrative purposes. This extension results in the short lane having a total length of approximately 80 meters, an approximate 60 meter extension. The impact of the proposal is shown in Figure 17.



Figure 16: Extension of short lane on Hendrikse Road.

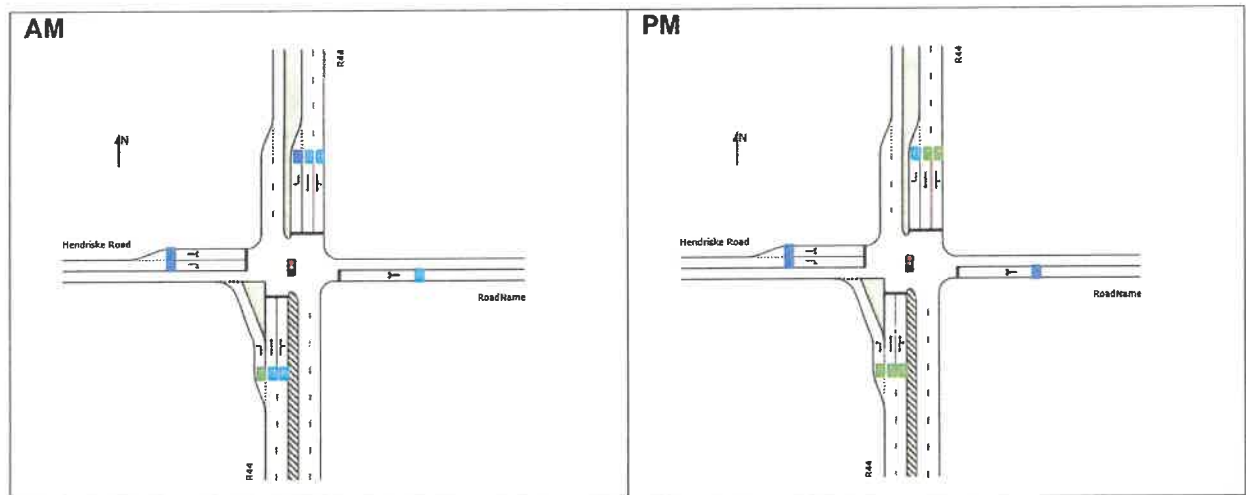


Figure 17: Intersection 1: R44 / Hendrikse Road Intersection AM and PM LOS dualled R44 with extended short lane on Hendrikse Road

As shown in Figure 18 converting Intersection 2: Hendrikse Road / Tolbos Road into an only a priority or stop control on Tolbos Road improves the performance of the intersection.

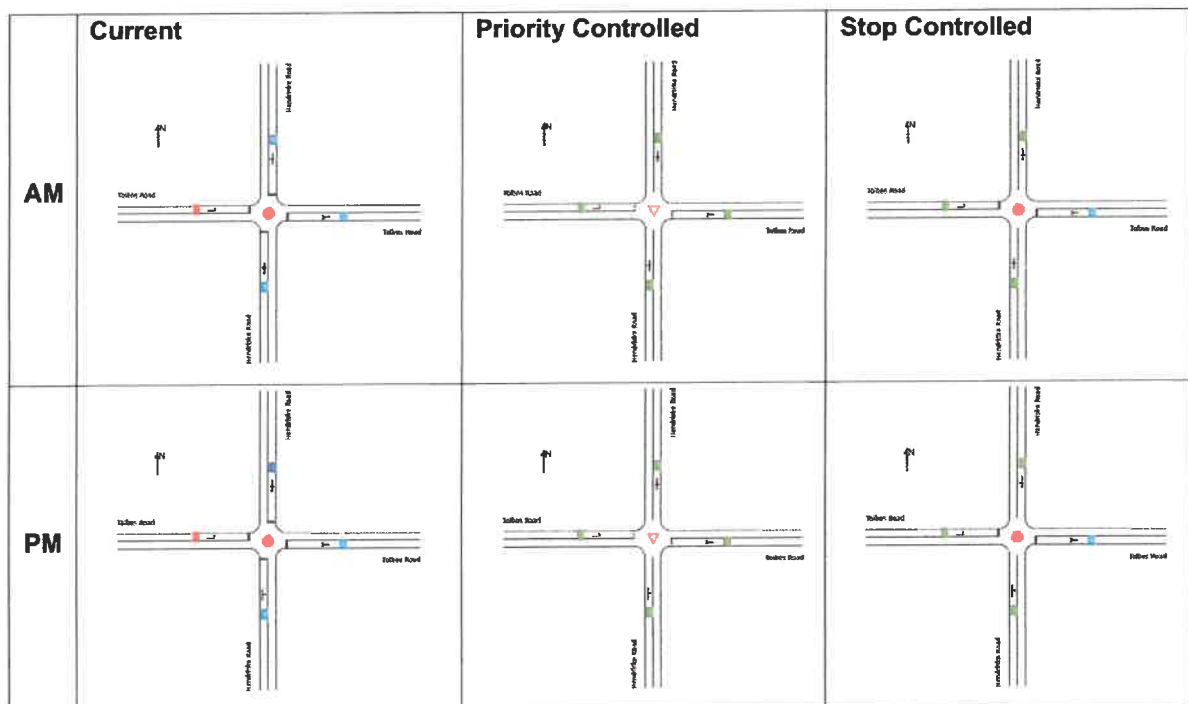


Figure 18: Intersection 2: Hendrikse Road / Tolbos Road Conversion affect 2026 Background Traffic plus All Developments

As shown in Figure 19 converting Intersection 5: Lang Road / Gabriels Road into only a priority or stop control on Gabriels Road improves the performance of the intersection.

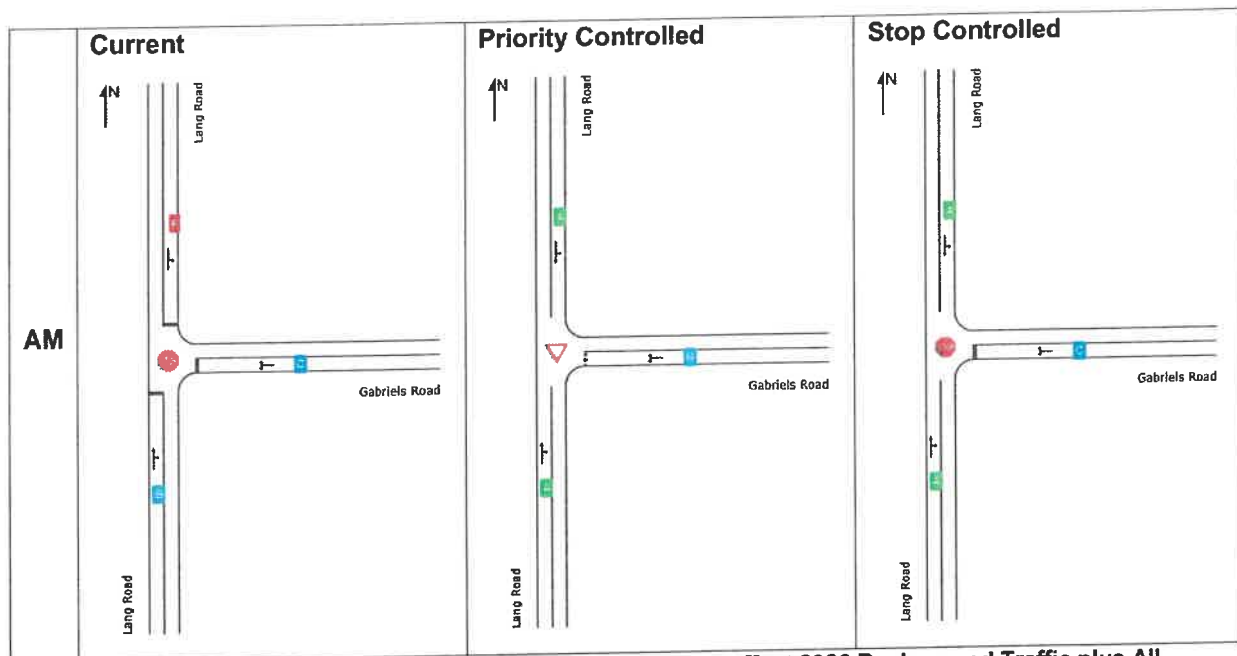


Figure 19: Intersection 5: Lang Road / Gabriels Road Conversion affect 2026 Background Traffic plus All Developments

3.7 2031 Future Traffic (Escalated Existing + All Developments)

The future traffic, 5 years post implementation of the Cloeteville development (2031) traffic conditions, was also evaluated. The future traffic consisted of the existing traffic escalated with a 2% growth rate over 9 or 7 years (depending on when the traffic counts were conducted), plus all development trips (which included the entire Kayamandi Northern Extension). The results of modelling this scenario are summarised in Table 8 and included as Appendix F.

As mentioned previously, Intersection 2: Hendrikse Road / Tolbos Road with the introduction of the Cloeteville development the intersection still operates at an overall acceptable LOS and is a minor intersection located in the residential area. Thus, this is not a major concern. However, the affects of converting this intersection into a stop control or priority control on just Tolbos Road is shown in Figure 21.

Intersection 5: Lang Road / Gabriels Road was found to operate under LOS F conditions. Due to the poor performance of the northern approach. As a mitigation measure, it may be beneficial to convert this intersection to only include a priority control or stop controlled on Gabriel Road, which is the minor approach. The effect of converting the intersection is shown in Figure 22.

The R304 / Welgevonden Boulevard intersection (Intersection 7) was found to operate under poor conditions during the AM and PM for estimated 2031 traffic conditions. It may be necessary to dual the R304 further beyond the Welgevonden Boulevard heading north, however this may only shift the problem area further north. Or an entirely separate solution may be required. Such as the potential of the Western Bypass that is planned to be implemented in the Stellenbosch area. The Western Bypass could relief some of the traffic congestion on the R304, however it can not be tested in this TIA since it is beyond the scope.

For Intersection 8: R44 / Fir Street the minor approaches were found to operate under LOS F conditions during the AM peak hour. The volumes on these minor approaches are insignificant compared to the volumes travelling on the major approach, on the R44. These approaches experience acceptable LOS, additionally the delays experienced on these minor approaches are just over a minute long (82 – 85 seconds). The performance of these minor approaches is thus not a major concern as of yet.

Table 8: 2031 Future Traffic Intersection Analyses

No.	Intersection Name	Peak Period	Delay (sec)	V/C Ratio	Overall LOS	Approach Leg Level of Service			
						South	East	North	West
1	R44 / Hendrikse Road Traffic Signal	AM	29.4	0.90	C	C	B	C	C
		PM	10.0	0.71	B	A	C	A	C
2	Hendrikse Road / Tolbos Road All-way stop	AM	18.3	0.53	C	B	B	B	F
		PM	30.9	1.00	D	B	B	C	F
3	Hendrikse Road / Williams Road All-way stop	AM	14.1	0.33	B	C	B	-	B
		PM	13.8	0.35	B	C	B	-	B
4	Hendrikse Road / Rhode Street Yield on southern side	AM	2.3	0.09	A	A	A	A	A
		PM	2.8	0.09	A	A	A	A	A
5	Lang Road / Gabriels Road All-way stop	AM	74.4	1.06	F	B	D	F	-
		PM	18.8	0.68	C	C	C	C	-
6	Lang Road / Welgevonden Stop on southern side	AM	6.1	0.50	A	A	A	-	A
		PM	5.9	0.33	A	A	A	-	A
7	R304 / Welgevonden Blvd Traffic Signal	AM	66.3	0.99	E	E	D	E	-
		PM	94.6	0.87	F	F	D	D	-
8	R44 / Fir Street Traffic Signal	AM	35.3	0.97	D	A	-	D	F
		PM	5.2	0.67	A	A	-	A	D

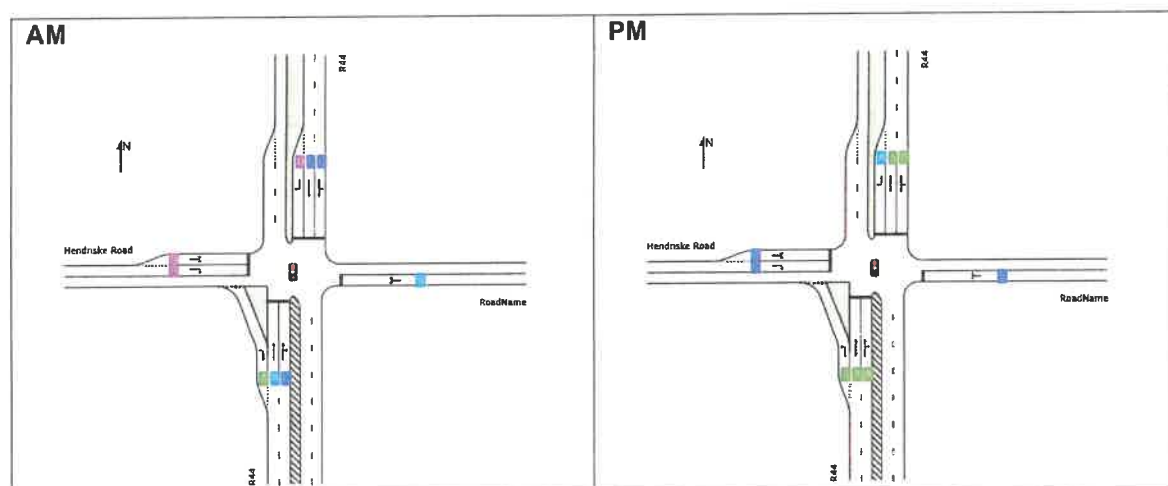


Figure 20: Intersection 1: R44 / Hendrikse Road - AM and PM LOS future 2031 Traffic Conditions

3.7.1 Mitigation Measures

As shown in Figure 21, converting Intersection 2: Hendrikse Road / Tolbos Road into either only a stop or priority control on Tolbos Road are both effective in improving the performance of the intersection.

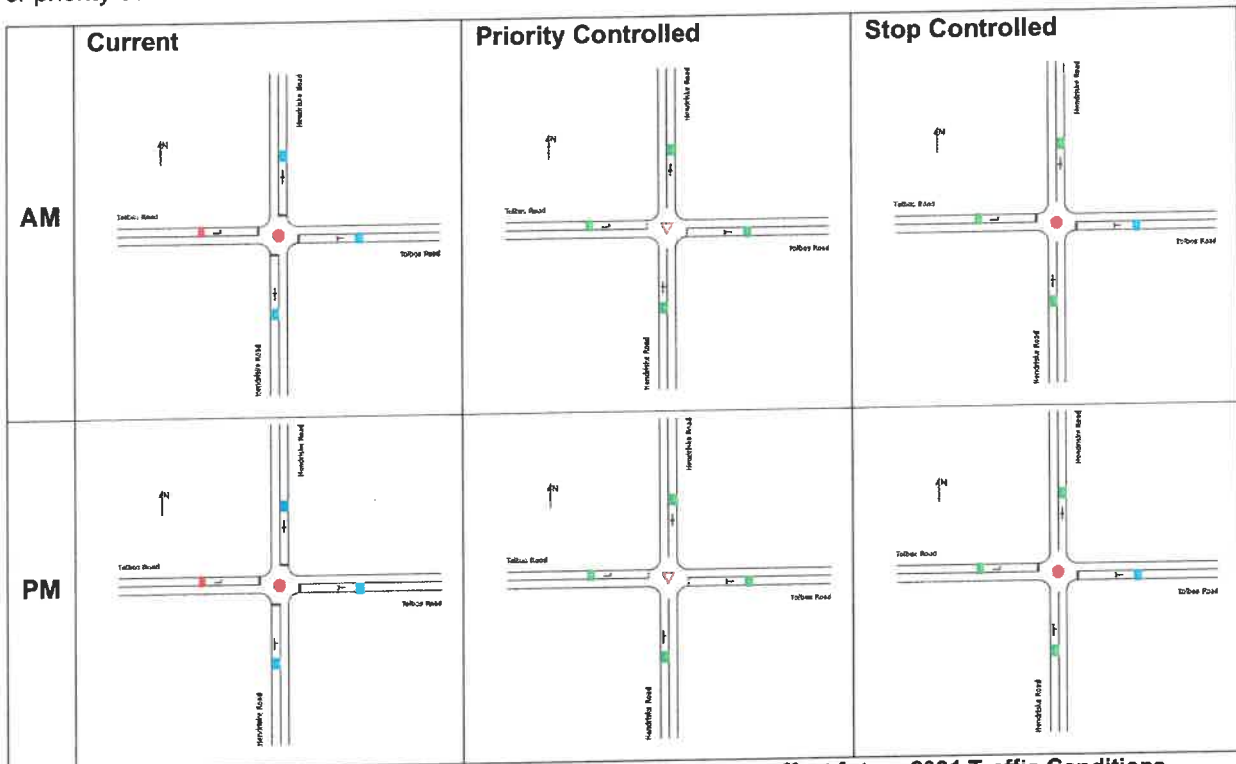


Figure 21: Intersection 2: Hendrikse Road / Tolbos Road Conversion affect future 2031 Traffic Conditions

As shown in Figure 22, converting Intersection 5: Lang Road / Gabriels Road into either only an stop or priority control on Gabriels Road are both effective in improving the performance of the intersection.

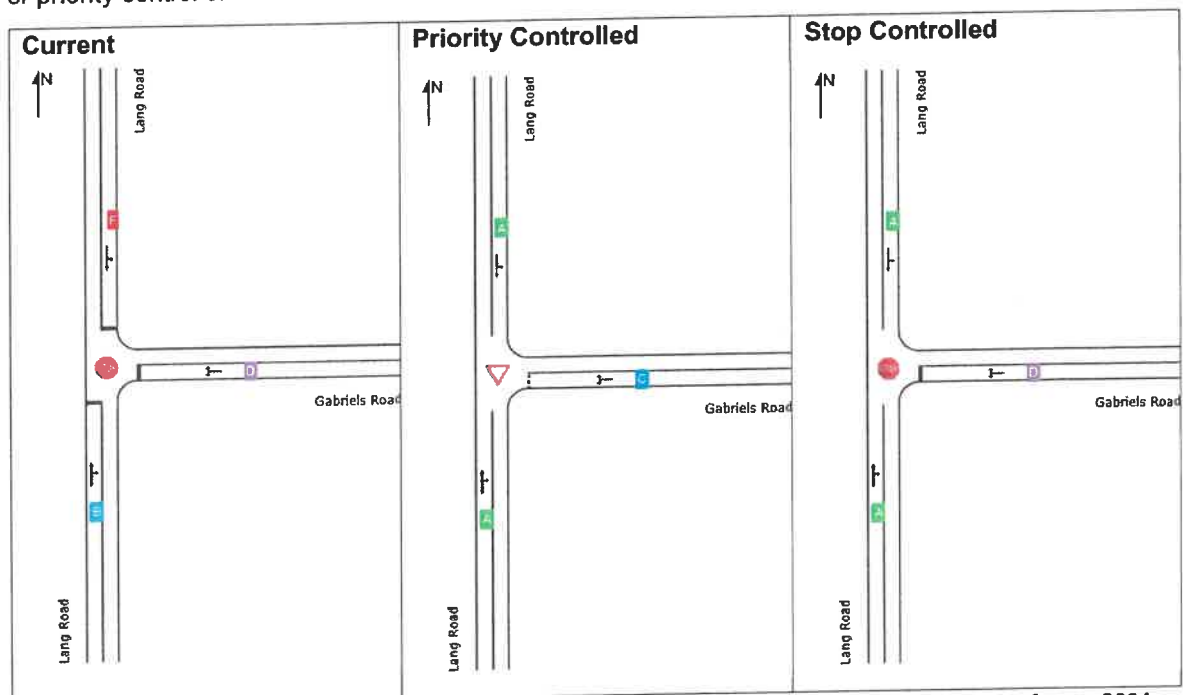


Figure 22: Intersection 5: Lang Road / Gabriels Road Converted affect during AM Peak hour future 2031 Traffic Conditions

4 Access Management

Based on the intersection modelling and analysis of traffic patterns in Cloeteville, it is evident that the intersection of R44 and Hendrikse requires some attention even with the already planned upgrades. However, the physical constraints of the site make upgrading the intersection, like providing a second right turn lane, a challenge. Hendrikse Road is one of the main access roads to both Cloeteville and Welgevonden Estate. There is also a *mini* commercial hub right at the intersection. For these reasons the traffic congestion is **already** quite bad and will likely only increase in the future, regardless of the proposed development.

A contributing factor to the poor LOS at R44 x Hendrikse is that this portion of the R44 is a single carriageway. The southern portion is a dual carriageway. This single carriageway portion is the location of the **only** signalised access to Cloeteville from the R44. Whereas over the dualled portion, there are two stop controlled accesses to Cloeteville.

An option to consider is providing another signalised access road from the R44 into Cloeteville. Currently both Fir Road is a two-way stop-controlled intersections onto the R44. This intersection easily facilitates left turn movements, but right turning vehicles rely on gaps in traffic and have to cross a 2-lane carriageway and median, because the R44 is dualled at these locations. In terms of signalised access spacing, Fir Road is located 1.1km from Hendrikse Road in the north and 1.2km north of the next signalised intersection. Providing another signalised access for Cloeteville will help distribute traffic and alleviate the pressure at Hendrikse Road.

On the western edge, the Welgevonden Blvd intersection will require some upgrading, however this is not caused by the Cloeteville development but rather by growth in background traffic and other planned developments. The R304 needs to be considered carefully, given the high traffic volumes and the size of the planned developments adjacent to the R304.

5 NMT and Public Transport

An increase in pedestrian activity can be expected on the Cloeteville road network, either as the main mode of transport or as a means of accessing public transport. Therefore, the Municipality should consider the existing and required expansion of NMT and PT facilities. Figure 23 shows the existing and proposed PT and NMT facilities.

As shown in Figure 23, the NMT facilities in the study area are extensive, with sidewalks along Williams Road, Rhode Road, Gabriels Road and most of Hendrikse Road. It is proposed to extend the sidewalks along Hendrikse Road along its entire length, from the R44 intersection to the February intersection. It is also proposed to provide sidewalk facilities along Tolbos Road and February Road.

A significant number of traffic calming elements are also found in the study area, in the form of speed bumps. Expansion on these elements are proposed in Figure 23, ten new traffic calming elements are proposed. Which include six new speed bumps and four new raised intersections. Due to the topography of the study area it will be essential to reduce the speeds of vehicles. Three speed bumps proposed are also located near turns in the road, February Road, Gabriels Road and Tolbos Road, to reduce vehicle speeds through the turns.

Two new potential PT drop off points are also proposed as shown in Figure 23. These areas have sufficient space available to accommodate an PT embayment stop.

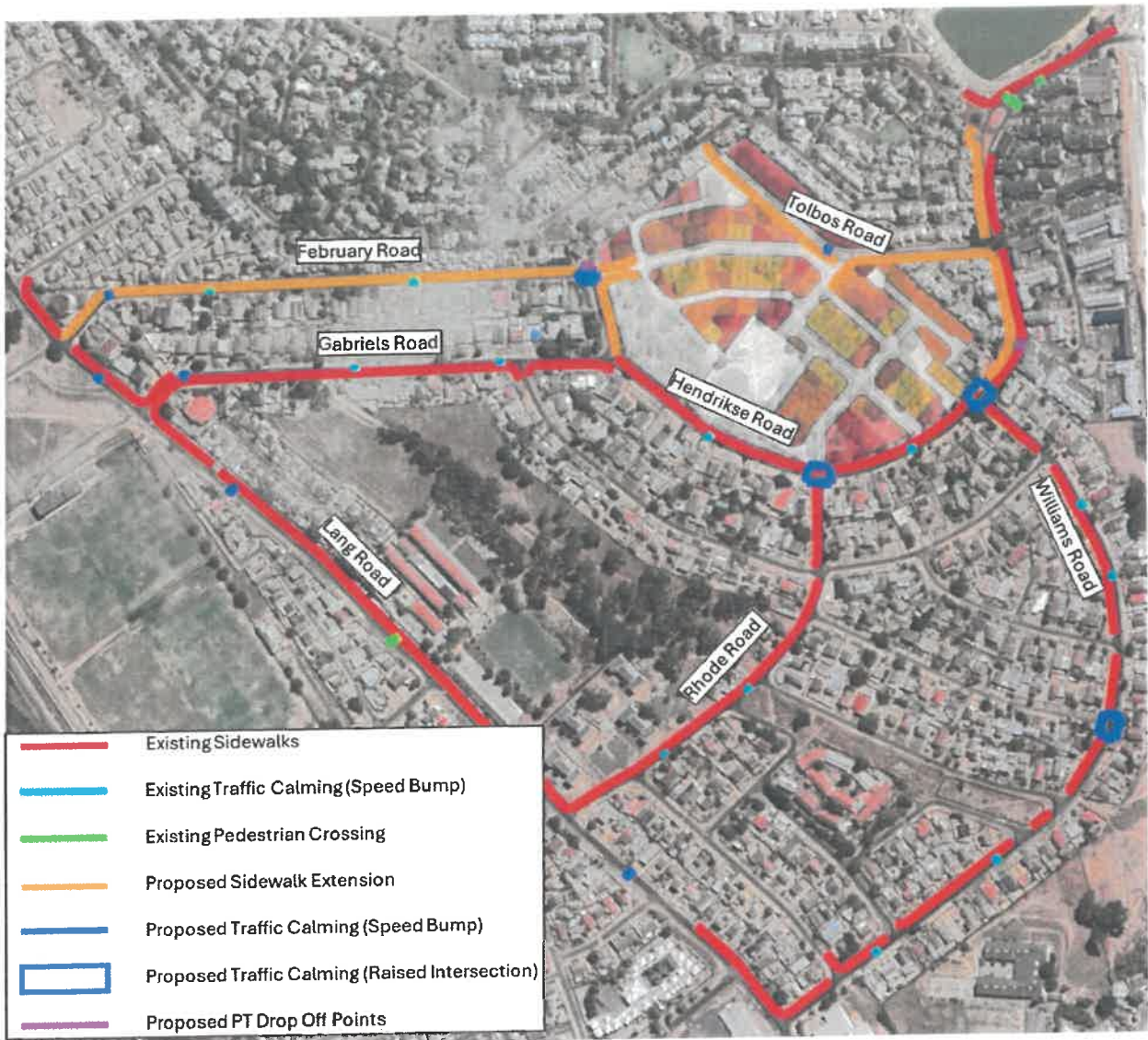


Figure 23: Proposed PT and NMT Expansion

6 Conclusions

Based on the assessment of future traffic conditions, all the study intersections inside Cloetesville *can* operate at acceptable LOS. All the future scenarios continue to operate at the **same** Levels of Service as the background traffic scenario. This is evidence that the delay and LOS issues at the key intersections are systemic and not as a result of the introduction of the development. Adjustments to the R304 intersection can improve the LOS for all approaches. The intersection of R44 and Hendrikse Road is a concern, however it can operate under acceptable conditions with additional upgrades.

- The R44 x Hendrikse intersection requires attention from the Municipality and/or the Western Cape Government, regardless of the proposed development. Even with the current upgrades under construction, it may not be sufficient to accommodate the traffic volumes travelling through the intersection. Especially, the volumes turning right from Hendrikse Road. It has been demonstrated that changes to the layout can have a positive impact on the overall LOS, especially the R44 approaches. Providing an additional extended right turning lane is also recommended on the Hendrikse approach.

- An option for consideration is providing another signalised intersection on the R44 at Fir Road which is currently two-way stop controlled. Fir Road is approximately 1.2km south of Hendrikse Road. Providing another signalised access on the R44 for Cloeteville will help distribute traffic and alleviate the pressure at Hendrikse Road; and not impact overall mobility of the route.
- The intersection of R304 x Welgevonden is the only access from the West into Cloeteville. The R304 is one of the key links of the N1 and Stellenbosch CBD. As Cloeteville and Welgevonden continue to grow more and more pressure will be placed on this intersection.

Currently operates under acceptable LOS conditions.

This intersection needs to be upgraded later on to accommodate the growth in Background traffic and the introduction of the Newinbosch Development under construction. The Cloeteville Development has little impact on this intersection.

- The SIDRA modelling revealed that both the control systems for the Hendrikse / Tolbos and Lang Road / Gabriel Road can be converted into a stop or priority control on only the minor approaches. However, there are site constraints and safety concerns that are improved by having the stop controlled intersection.
- An increase in pedestrian activity is expected, consideration must be given to expanding the provision of sidewalks along Hendrikse Road and Gabriels Road to link with Lang Street which is the main route for public transport within Cloeteville.

7 Recommendations

From a traffic and transport point of view there is no reason for this infill housing project to not be approved. The additional traffic created by the development is not the cause of the failing intersection at the R44.

It is recommended that the signal phasing at the R304 x Welgevonden intersection be reviewed in light of intersection modelling results in this report. In addition, to upgrading this intersection by dualling of sections of the R304 leading up to the intersection.

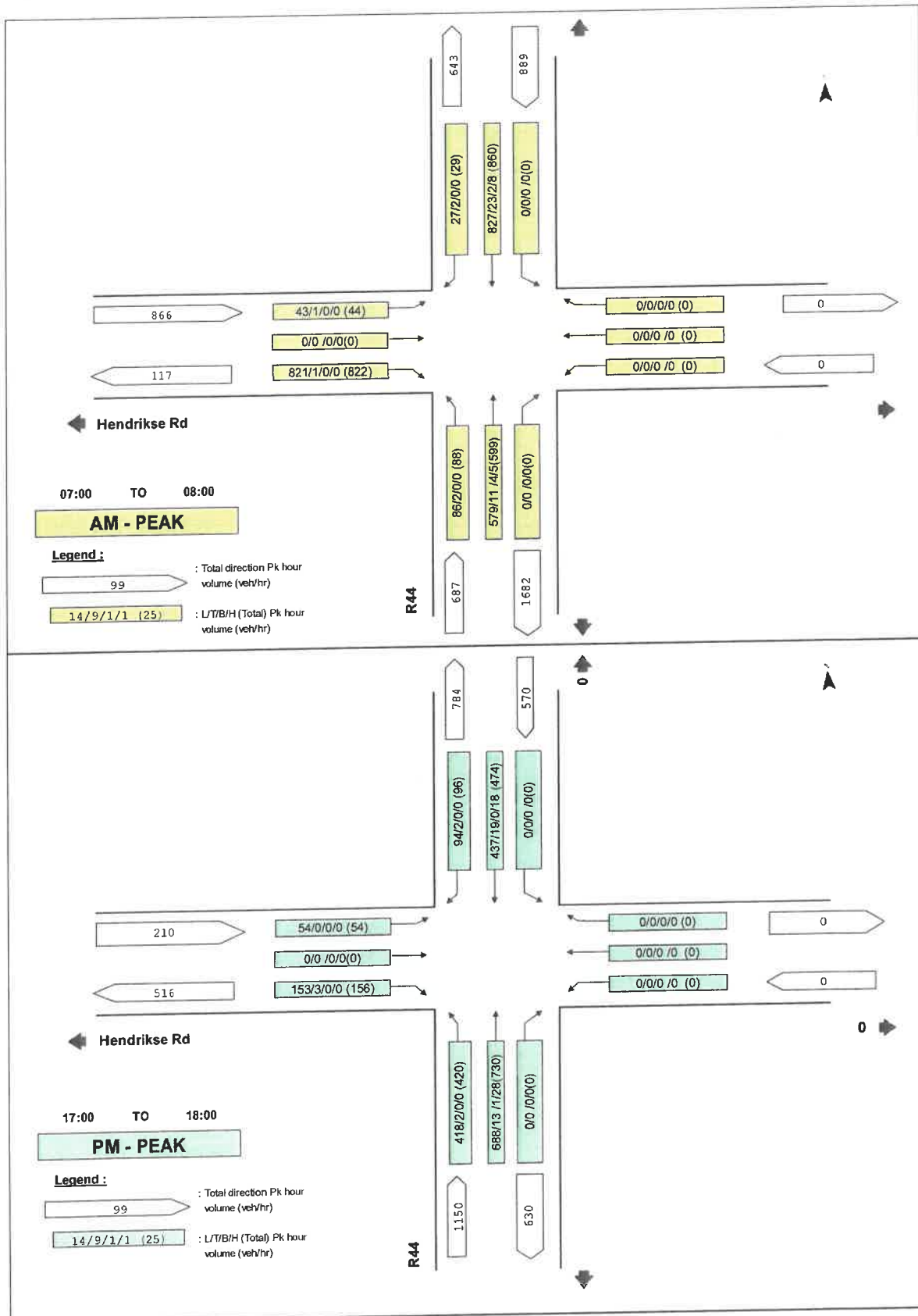
It is recommended that the signal phasing at the R44 x Hendrikse intersection be reviewed in light of intersection modelling results in this report. In addition, the R44 be fully dualled between the R44 / Hendrikse and R44 / Fir Street. Also, to extend the existing/planned short turning lane and make it an additional right turning lane.

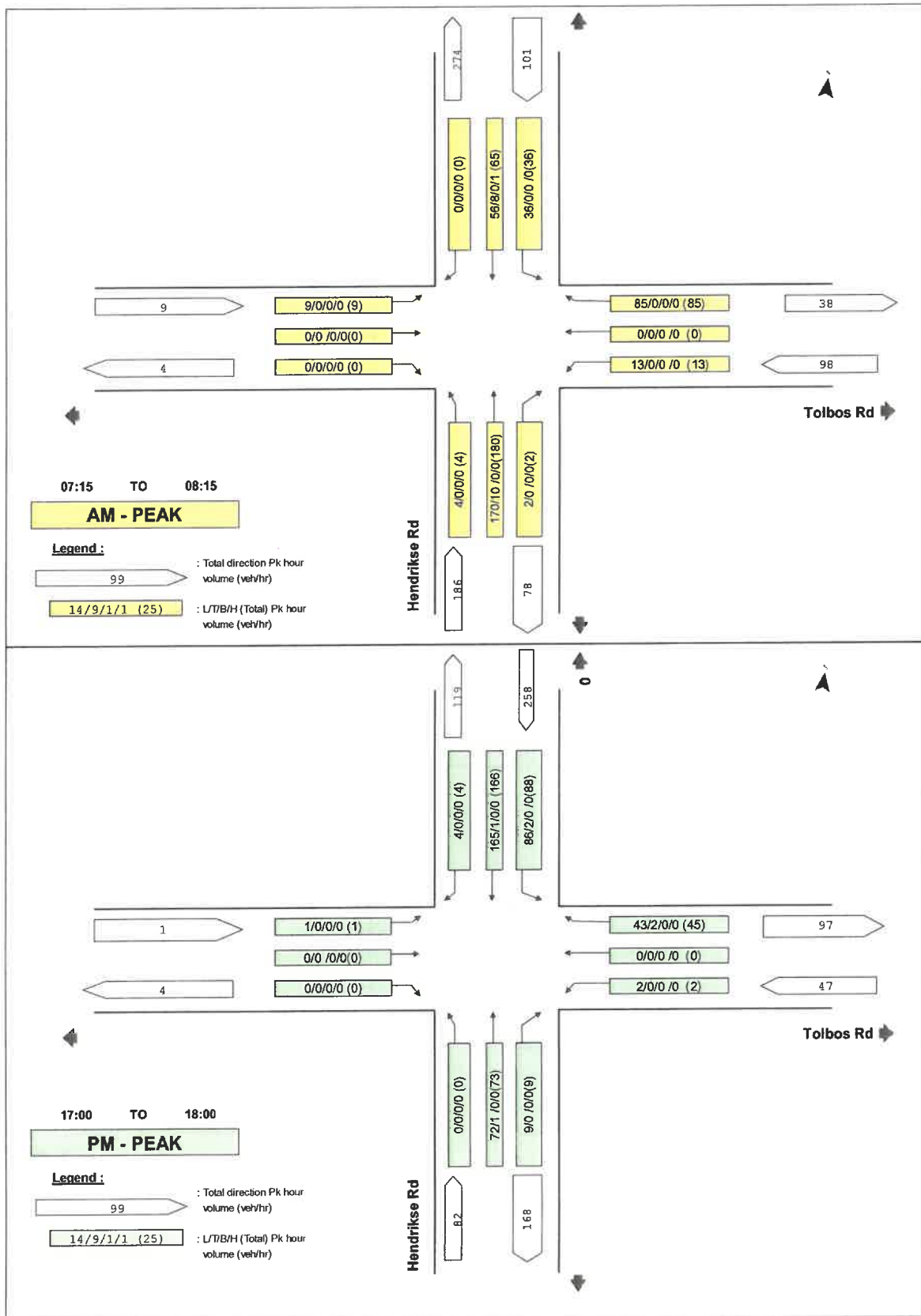
It is recommended to convert the existing R44 / Fir Street stop-controlled intersection into a signalised intersection.

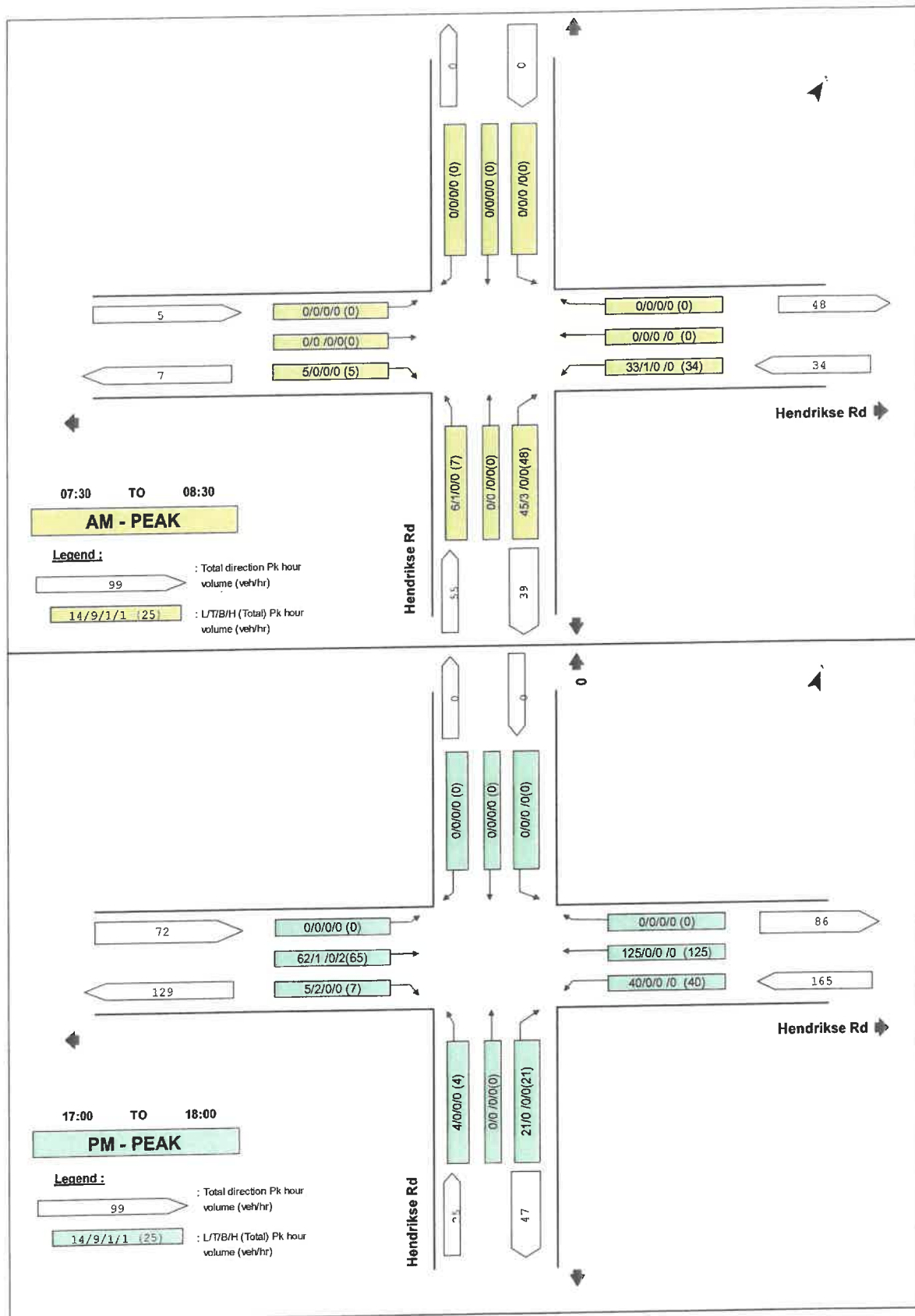
Finally, it is recommended that the Arterial Management plan for the R44 and R304 be reviewed in the light of the proposed signalisation of the Fir Road and R44 intersection and the plans for dualling the portion of the R44 adjacent to Cloeteville. Given the growth of the Cloeteville and its surrounding neighbourhoods, the dualling of the R44 will be needed in the near future. With the introduction of large development adjacent to the R304 and the high traffic volumes currently travelling on the R304, an alternative plan to alleviate traffic on the R304 must be further investigated, like the Western Bypass.

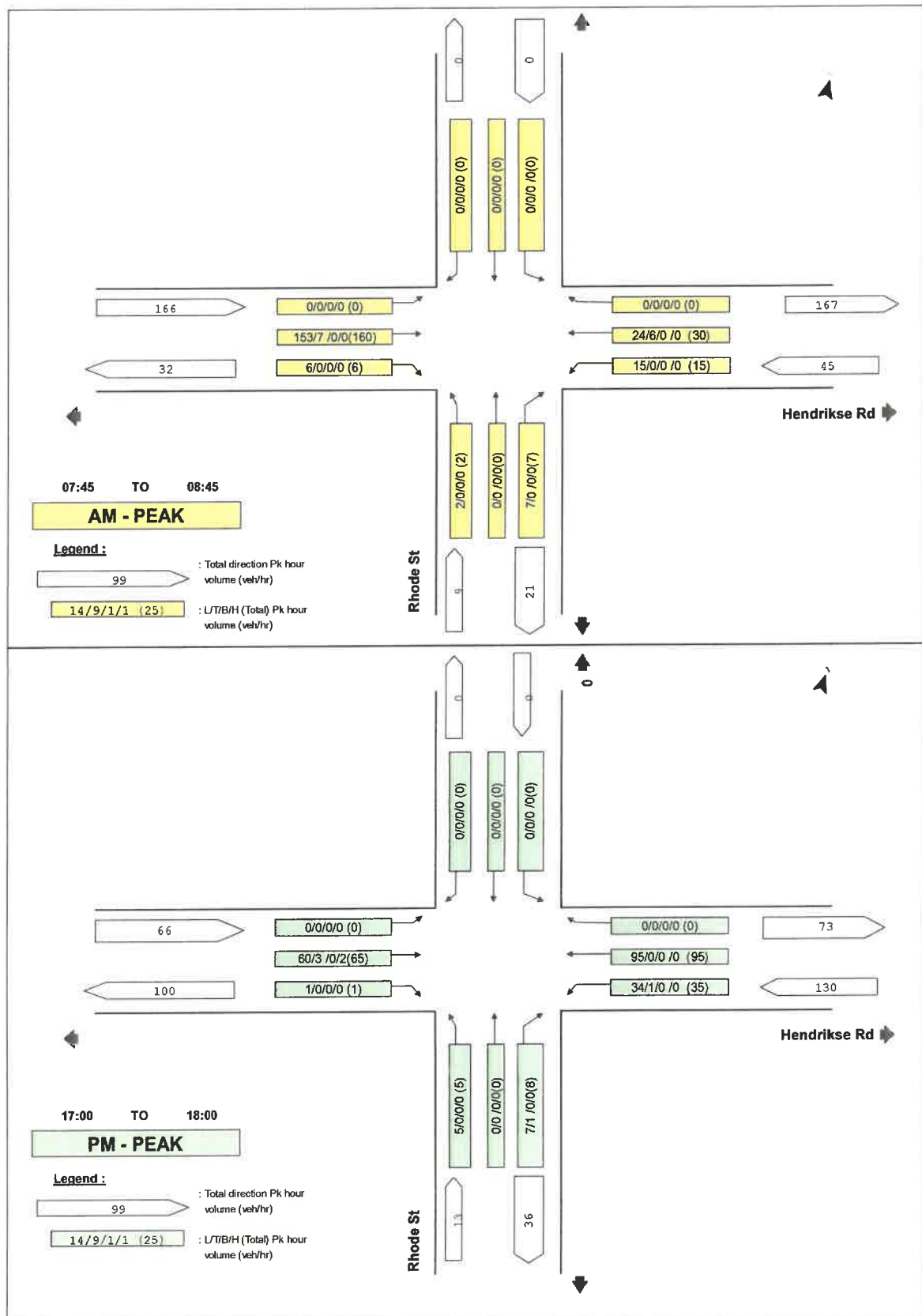
Appendix A

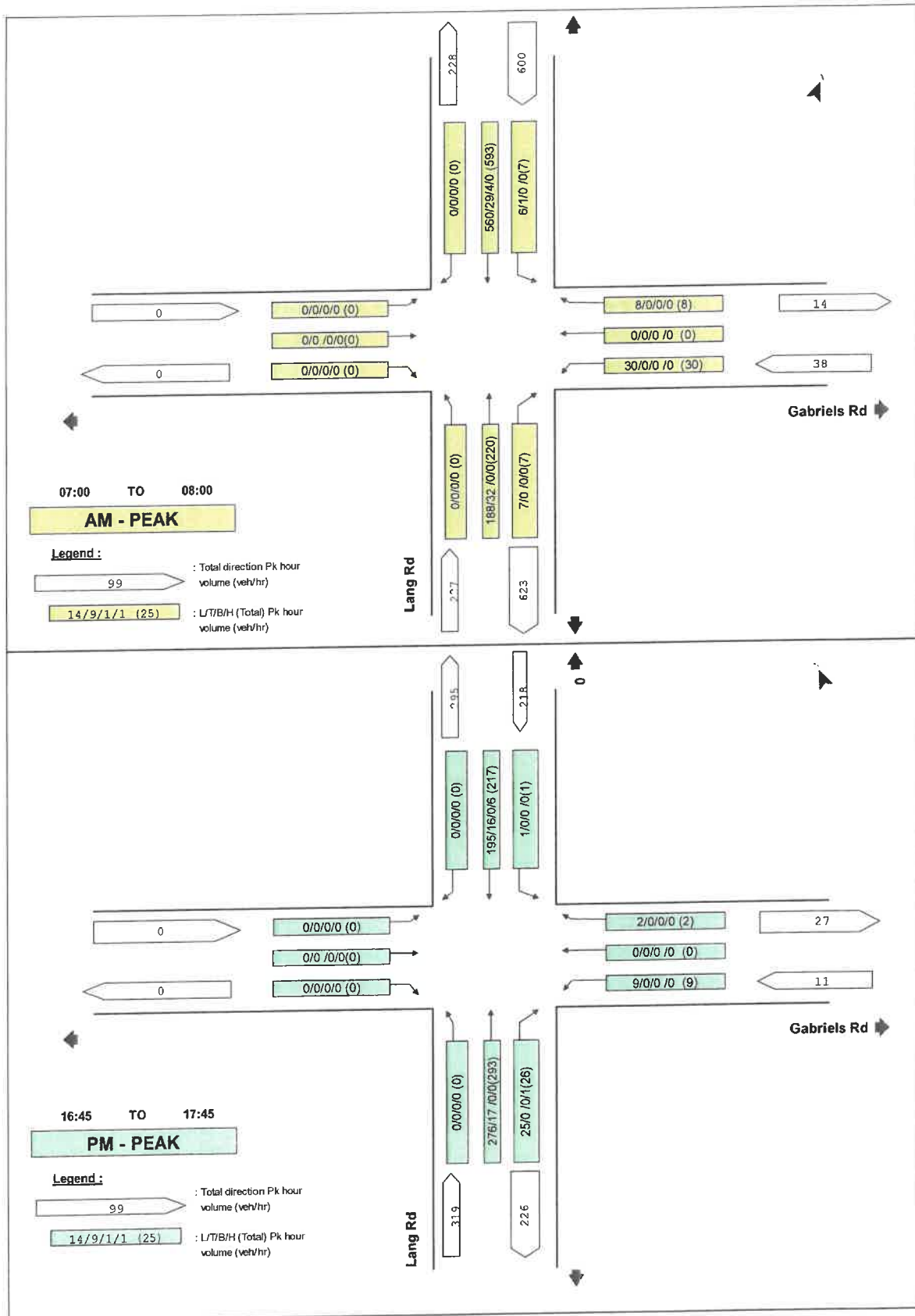
Traffic Counts

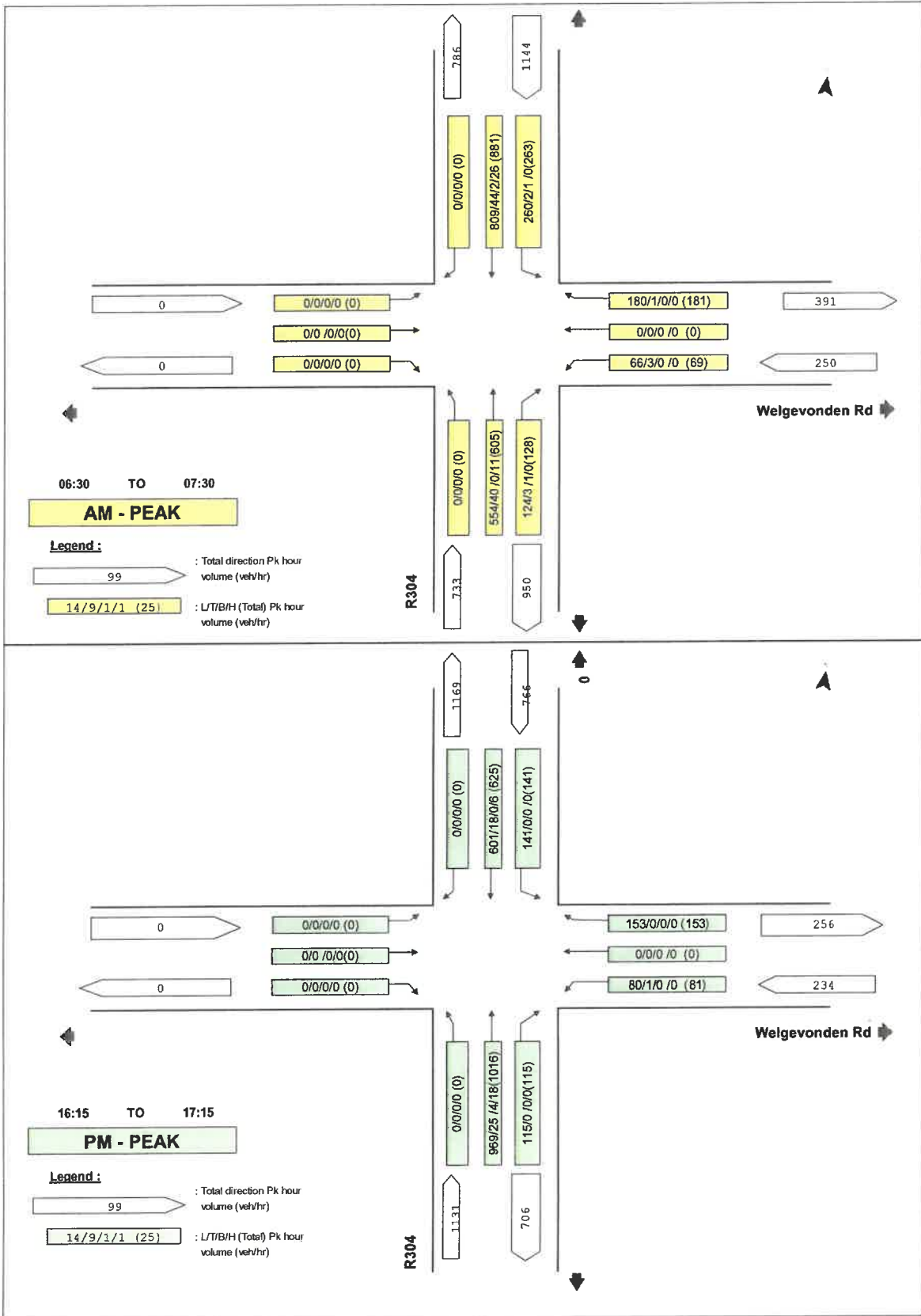


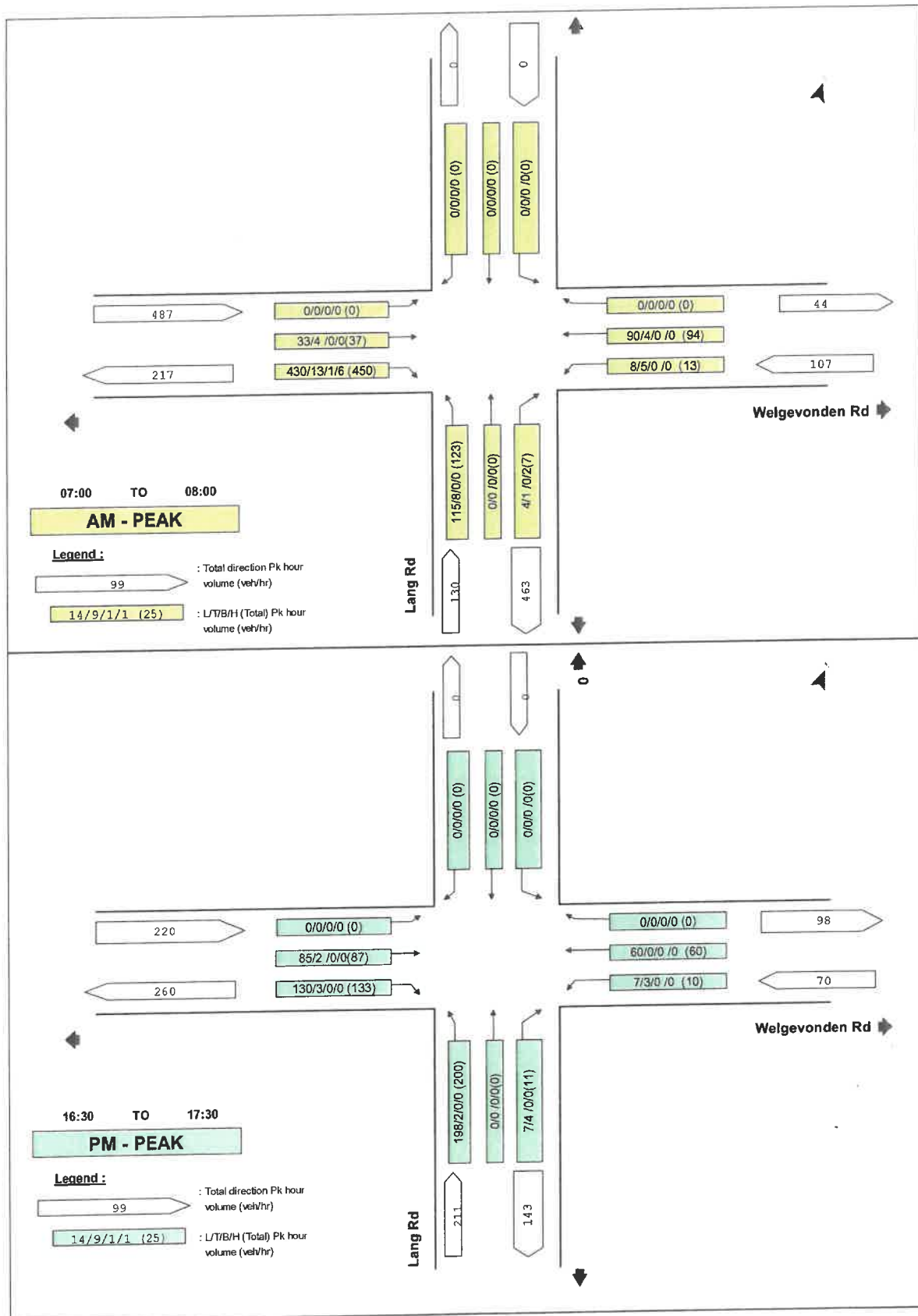


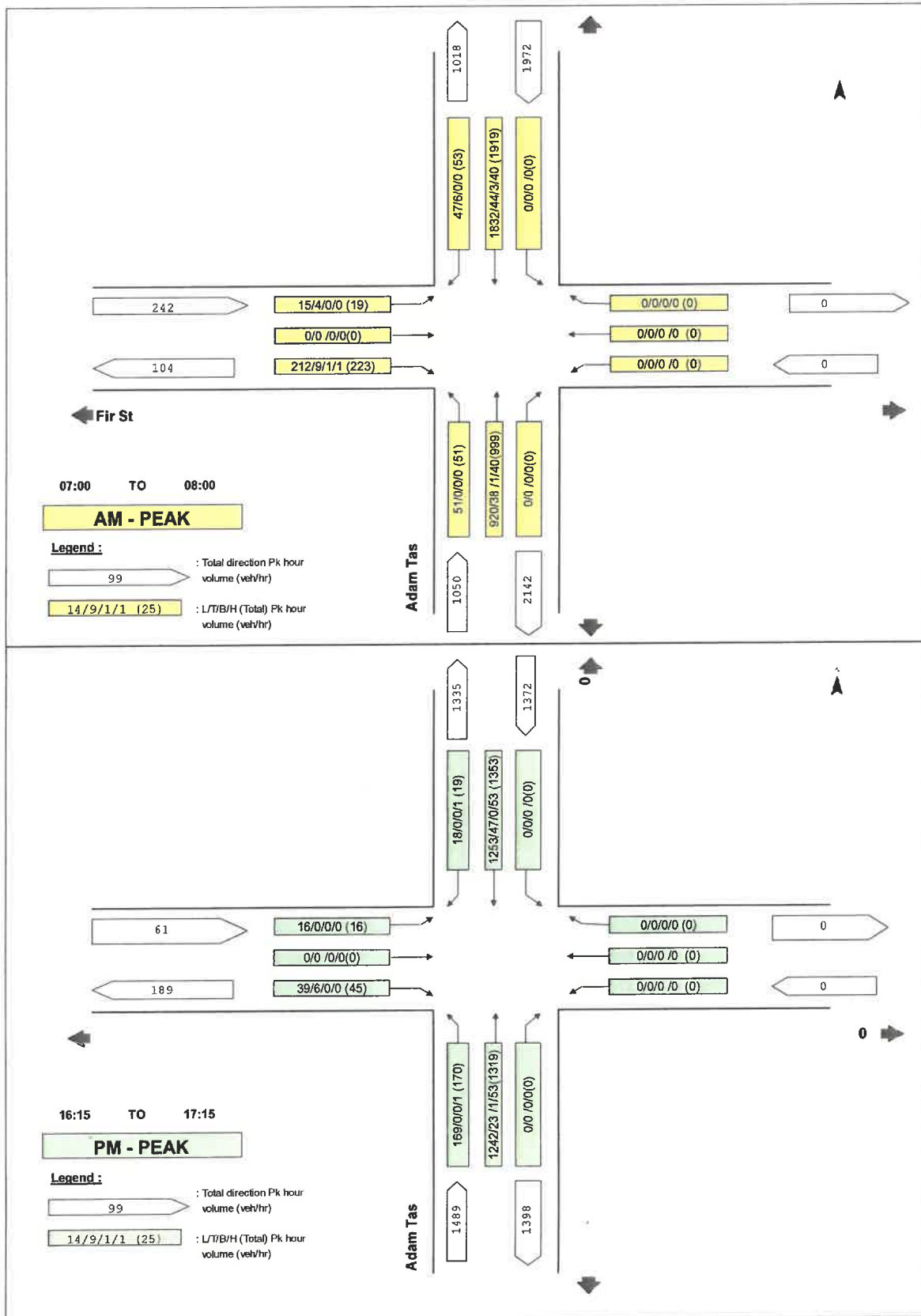












Appendix B

SIDRA Analysis Existing Traffic

LANE SUMMARY

Site: [Int 1: R44 / Hendriske Road_AM Peak (Site Folder: 2023 AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	% %
South: R44														
Lane 1	93	0.0	93	0.0	1518	0.061	100	12.9	LOS B	0.4	2.5	Short	120	0.0 NA
Lane 2	631	1.5	631	1.5	647 ¹	0.974	100	81.4	LOS F	48.7	345.4	Full	500	0.0 0.0
Approach	723	1.3	723	1.3		0.974		72.6	LOS E	48.7	345.4			
North: R44														
Lane 1	905	1.2	905	1.2	837 ¹	1.081	100	155.0	LOS F	89.5	633.1	Full	500	0.0 26.5
Lane 2	31	0.0	31	0.0	151	0.202	100	58.9	LOS E	1.1	7.6	Short	80	0.0 NA
Approach	936	1.1	936	1.1		1.081		151.8	LOS F	89.5	633.1			
West: Hendriske Road														
Lane 1	46	0.0	46	0.0	1037	0.045	100	47.4	LOS D	1.2	8.4	Short	20	0.0 NA
Lane 2	865	0.0	865	0.0	812 ¹	1.065	100	156.7	LOS F	83.2	582.6	Full	500	0.0 18.9
Approach	912	0.0	912	0.0		1.065		151.2	LOS F	83.2	582.6			
All Vehicles	2571	0.8	2571	0.8		1.081		129.3	LOS F	89.5	633.1			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)

South: R44

Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit:	W	N			veh/h	v/c	%	%	
Lane 1	93	-	93	0.0	1518	0.061	100	0.0	2
Lane 2	-	631	631	1.5	647 ¹	0.974	100	NA	NA
Approach	93	631	723	1.3		0.974			

North: R44

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From N To Exit:	S	W			veh/h	v/c	%	%	
Lane 1	905	-	905	1.2	837 ¹	1.081	100	NA	NA
Lane 2	-	31	31	0.0	151	0.202	100	0.0	1
Approach	905	31	936	1.1		1.081			

West: Hendriske Road

Mov.	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From W To Exit:	N	S							
Lane 1	46	-	46	0.0	1037	0.045	100	0.0	2
Lane 2	-	865	865	0.0	812 ¹	1.065	100	NA	NA
Approach	46	865	912	0.0		1.065			
Total %HV/Deg. Satn (v/c)									
All Vehicles	2571	0.8		1.081					

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Opposing Flow Rate %veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
------------------------	------------------------------	--	------------------------	-----------------------------	-------------------------------------	---------------------	----------------------	-----------------------

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: R44				
Lane 1	0.0	34.0	146.1	NA
Lane 2	0.0	0.0	0.0	0.0
West: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	26.5	117.4	NA

LANE SUMMARY

**Site: Int1 [Int 1: R44 / Hendriske Road_AM Peak_Upgraded
(Site Folder: 2023 AM Peak)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.	
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]						[Veh]	[Dist m]			m	%
South: R44															
Lane 1	93	0.0	93	0.0	1489	0.062	100	27.8	LOS C	0.4	2.5	Short	80	0.0	NA
Lane 2	631	1.5	631	1.5	530 ¹	1.190	100	263.6	LOS F	77.2	547.5	Full	500	0.0	13.2
Lane 3	1	0.0	1	0.0	114	0.009	100	86.7	LOS F	0.1	0.4	Short	45	0.0	NA
Approach	724	1.3	724	1.3		1.190		233.2	LOS F	77.2	547.5				
East: RoadName															
Lane 1	2	0.0	2	0.0	818	0.003	100	19.6	LOS B	0.1	0.4	Full	500	0.0	0.0
Approach	2	0.0	2	0.0		0.003		19.6	LOS B	0.1	0.4				
North: R44															
Lane 1	553	1.2	553	1.2	726	0.762	100	35.4	LOS D	28.3	200.0	Full	500	0.0	0.0
Lane 2	354	1.2	354	1.2	726	0.487	64 ⁶	40.3	LOS D	15.7	111.1	Full	500	0.0	0.0
Lane 3	31	0.0	31	0.0	159	0.192	100	39.4	LOS D	1.2	8.5	Short	80	0.0	NA
Approach	937	1.1	937	1.1		0.762		37.4	LOS D	28.3	200.0				
West: Hendriske Road															
Lane 1	46	0.0	46	0.0	1161	0.040	100	41.3	LOS D	1.0	7.1	Short	20	0.0	NA
Lane 2	865	0.0	865	0.0	730 ¹	1.185	100	253.0	LOS F	107.3	750.9	Full	500	0.0	42.2
Approach	912	0.0	912	0.0		1.185		242.2	LOS F	107.3	750.9				
All Vehicles	2575	0.8	2575	0.8		1.190		165.0	LOS F	107.3	750.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

⁶ Lane under-utilisation due to downstream effects

Approach Lane Flows (veh/h)

South: R44

Mov. From S To Exit	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	W	N	E							
Lane 1	93	-	-	93	0.0	1489	0.062	100	0.0	2
Lane 2	-	631	-	631	1.5	530 ¹	1.190	100	NA	NA
Lane 3	-	-	1	1	0.0	114	0.009	100	0.0	2
Approach	93	631	1	724	1.3		1.190			

East: RoadName

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From E To Exit	S	N			veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	1	1	2	0.0	818	0.003	100	NA	NA
Approach	1	1	2	0.0		0.003			

North: R44

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From N To Exit	E	S	W			veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	1	552	-	553	1.2	726	0.762	100	NA	NA
Lane 2	-	354	-	354	1.2	726	0.487	64 ⁶	NA	NA
Lane 3	-	-	31	31	0.0	159	0.192	100	0.0	2
Approach	1	905	31	937	1.1		0.762			

West: Hendriske Road

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From W To Exit	N	S			veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	46	-	46	0.0	1161	0.040	100	0.0	2
Lane 2	-	865	865	0.0	730 ¹	1.185	100	NA	NA
Approach	46	865	912	0.0		1.185			
Total									

All Vehicles 2575 0.8 1.190

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.
- 6 Lane under-utilisation due to downstream effects

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppng In Lane	Flow Rate	Opposing Flow Rate	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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South Exit: R44

Merge Type: Priority

Exit Short Lane	2	120	0.0	918	921	3.01	2.01	719	832 0.864	2.2	9.7
Merge Lane	1	-	100.0	Merge Lane is not Opposed				918	1800 0.510	0.0	0.0

North Exit: R44

Merge Type: Priority

Exit Short Lane	1	60	0.0	554	558	3.00	2.00	23	1225 0.019	1.0	1.1
Merge Lane	2	-	100.0	Merge Lane is not Opposed				554	1800 0.308	0.0	0.0

Variable Demand Analysis

Initial Queued Demand	Residual Queued Demand	Time for Residual Demand to Clear	Duration of Oversatn
veh	veh	sec	sec

South: R44

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	50.4	342.3	NA
Lane 3	0.0	0.0	0.0	0.0

East: RoadName

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

North: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	67.4	332.1	NA

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LANE SUMMARY

Site: Int1 [Int 1: R44 / Hendriske Road_AM
Peak_NextUpgraded (Site Folder: 2023 AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 40 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist] m		m	%	%
South: R44															
Lane 1	93	0.0	93	0.0	1335	0.069	100	6.7	LOS A	0.3	2.1	Short	20	0.0	NA
Lane 2	166	1.5	166	1.5	579	0.286	35 ⁶	13.1	LOS B	2.6	18.4	Full	500	0.0	0.0
Lane 3	466	1.5	466	1.5	576	0.808	100	18.5	LOS B	10.2	72.1	Short	45	0.0	NA
Approach	724	1.3	724	1.3		0.808		15.8	LOS B	10.2	72.1				
East: RoadName															
Lane 1	2	0.0	2	0.0	633	0.003	100	13.3	LOS B	0.0	0.2	Full	500	0.0	0.0
Approach	2	0.0	2	0.0		0.003		13.3	LOS B	0.0	0.2				
North: R44															
Lane 1	553	1.2	553	1.2	581	0.952	100	35.4	LOS D	17.5	123.9	Full	500	0.0	0.0
Lane 2	354	1.2	354	1.2	581	0.609	64 ⁶	37.6	LOS D	6.3	44.4	Full	500	0.0	0.0
Lane 3	31	0.0	31	0.0	199	0.153	100	24.9	LOS C	0.6	4.2	Short	80	0.0	NA
Approach	937	1.1	937	1.1		0.952		35.9	LOS D	17.5	123.9				
West: Hendriske Road															
Lane 1	537	0.0	537	0.0	486 ¹	1.104	100	139.2	LOS F	36.2	253.5	Short	20	0.0	NA
Lane 2	375	0.0	375	0.0	506 ¹	0.741	67 ⁶	49.4	LOS D	7.4	51.7	Full	500	0.0	0.0
Approach	912	0.0	912	0.0		1.104		102.2	LOS F	36.2	253.5				
All Vehicles	2575	0.8	2575	0.8		1.104		53.7	LOS D	36.2	253.5				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab). Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.
- 6 Lane under-utilisation due to downstream effects

Approach Lane Flows (veh/h)											
South: R44											
Mov.	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Av. Delay	Queue No.
From S To Exit	W	N	E			veh/h	v/c	%	%	sec	
Lane 1	93	-	-	93	0.0	1335	0.069	100	0.0	2	
Lane 2	-	166	-	166	1.5	579	0.286	35 ⁶	NA	NA	
Lane 3	-	465	1	466	1.5	576	0.808	100	48.3	2	
Approach	93	631	1	724	1.3		0.808				

East: RoadName

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From E					veh/h	Satn	Util.	SL Ov.	Lane
To Exit:	S	N				v/c	%	%	No.
Lane 1	1	1	2	0.0	633	0.003	100	NA	NA
Approach	1	1	2	0.0		0.003			

North: R44

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From N						veh/h	Satn	Util.	SL Ov.	Lane
To Exit:	E	S	W				v/c	%	%	No.
Lane 1	1	552	-	553	1.2	581	0.952	100	NA	NA
Lane 2	-	354	-	354	1.2	581	0.609	64 ⁶	NA	NA
Lane 3	-	-	31	31	0.0	199	0.153	100	0.0	2
Approach	1	905	31	937	1.1		0.952			

West: Hendriske Road

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From W					veh/h	Satn	Util.	SL Ov.	Lane
To Exit:	N	S				v/c	%	%	No.
Lane 1	46	490	537	0.0	486 ¹	1.104	100	100.0	2
Lane 2	-	375	375	0.0	506 ¹	0.741	67 ⁶	NA	NA
Approach	46	865	912	0.0		1.104			

	Total	%HV	Deg. Satn (v/c)
All Vehicles	2575	0.8	1.104

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.
- 6 Lane under-utilisation due to downstream effects

Merge Analysis

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Oppng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: R44												
Merge Type: Priority												
Exit Short Lane	2	120	0.0	997	1000	3.01	2.01	728	748	0.973	2.7	23.8
Merge Lane	1	-	100.0	Merge Lane is not Opposed				997	1800	0.554	0.0	0.0
North Exit: R44												
Merge Type: Priority												
Exit Short Lane	1	60	0.0	487	490	3.02	2.01	187	1283	0.146	0.8	1.1
Merge Lane	2	-	100.0	Merge Lane is not Opposed				487	1800	0.270	0.0	0.0

Variable Demand Analysis

Initial	Residual	Time for	Duration
Queued	Queued	Residual	of
Demand	Demand	Demand	Oversatn
veh	veh	to Clear	sec
		sec	
South: R44			
Lane 1	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0
East: RoadName			
Lane 1	0.0	0.0	0.0

North: R44

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

West: Hendriske Road

Lane 1	0.0	25.3	187.0	NA
Lane 2	0.0	0.0	0.0	0.0

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LANE SUMMARY

Site: [Int 2: Hendriske Road / Tolbos Road_AM Peak (Site Folder: 2023 AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
South: Hendriske Road															
Lane 1	183	0.0	183	0.0	648	0.283	100	13.4	LOS B	1.0	7.1	Full	500	0.0	0.0
Approach	183	0.0	183	0.0		0.283		13.4	LOS B	1.0	7.1				
East: Tolbos Road															
Lane 1	99	0.0	99	0.0	609	0.163	100	12.6	LOS B	0.5	3.7	Full	500	0.0	0.0
Approach	99	0.0	99	0.0		0.163		12.6	LOS B	0.5	3.7				
North: Hendriske Road															
Lane 1	116	0.9	116	0.9	525	0.221	100	14.6	LOS B	0.8	5.5	Full	500	0.0	0.0
Approach	116	0.9	116	0.9		0.221		14.6	LOS B	0.8	5.5				
West: Tolbos Road															
Lane 1	13	0.0	13	0.0	104	0.121	100	45.1	LOS E	0.4	3.0	Full	500	0.0	0.0
Approach	13	0.0	13	0.0		0.121		45.1	LOS E	0.4	3.0				
All Vehicles	411	0.3	411	0.3		0.283		14.5	LOS B	1.0	7.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit:	W	N	E			veh/h	v/c	%	%	
Lane 1	5	176	2	183	0.0	648	0.283	100	NA	NA
Approach	5	176	2	183	0.0		0.283			

East: Tolbos Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit:	S	N			veh/h	v/c	%	%	
Lane 1	12	87	99	0.0	609	0.163	100	NA	NA
Approach	12	87	99	0.0		0.163			

North: Hendriske Road

Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From N To Exit:	E	S			veh/h	v/c	%	%	
Lane 1	43	73	116	0.9	525	0.221	100	NA	NA

Approach 43 73 116 0.9 0.221

West: Tolbos Road

Mov.	L2	Total	%HV	Cap.	Deg. Satn	Lane Util	Prob. SL Ov.	Ov. Lane No.
From W To Exit	N			veh/h	v/c	%	%	
Lane 1	13	13	0.0	104	0.121	100	NA	NA
Approach	13	13	0.0		0.121			
Total	%HV	Deg. Satn	(v/c)					

All Vehicles 411 0.3 0.283

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppng in Lane	Flow Rate % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial Queued Demand	Residual Queued Demand	Time for Residual Demand to Clear	Duration of Oversatn
veh	veh	sec	sec

South: Hendriske Road

Lane 1 0.0 0.0 0.0 0.0

East: Tolbos Road

Lane 1 0.0 0.0 0.0 0.0

North: Hendriske Road

Lane 1 0.0 0.0 0.0 0.0

West: Tolbos Road

Lane 1 0.0 0.0 0.0 0.0

LANE SUMMARY

Site: [Int 3: Hendriske Road / Williams Road_AM Peak (Site Folder: 2023 AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total]	HV]	[Total]	HV]	veh/h	v/c	%	sec		[Veh]	Dist]		m	%	%
	veh/h	%	Veh/h	%							m				
South: Williams Road															
Lane 1	54	2.0	54	2.0	427	0.126	100	15.2	LOS C	0.4	3.0	Full	500	0.0	0.0
Approach	54	2.0	54	2.0		0.126		15.2	LOS C	0.4	3.0				
East: Hendriske Road															
Lane 1	84	1.3	84	1.3	513	0.164	100	14.2	LOS B	0.6	3.9	Full	500	0.0	0.0
Approach	84	1.3	84	1.3		0.164		14.2	LOS B	0.6	3.9				
West: RoadName															
Lane 1	140	0.0	140	0.0	659	0.212	100	12.6	LOS B	0.7	5.0	Full	500	0.0	0.0
Approach	140	0.0	140	0.0		0.212		12.6	LOS B	0.7	5.0				
All Vehicles	278	0.8	278	0.8		0.212		13.6	LOS B	0.7	5.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab). Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Williams Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit:	W	E			veh/h	v/c	%	%	
Lane 1	6	47	54	2.0	427	0.126	100	NA	NA
Approach	6	47	54	2.0		0.126			

East: Hendriske Road

Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit:	S	W			veh/h	v/c	%	%	
Lane 1	32	53	84	1.3	513	0.164	100	NA	NA
Approach	32	53	84	1.3		0.164			

West: RoadName

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From W To Exit:	E	S			veh/h	v/c	%	%	
Lane 1	136	4	140	0.0	659	0.212	100	NA	NA
Approach	136	4	140	0.0		0.212			

Total %HV/Deg. Satn (V/c)

All Vehicles 278 0.8 0.212

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppng in Lane	Flow Rate %veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
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South: Williams Road

Lane 1	0.0	0.0	0.0	0.0
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East: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
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West: RoadName

Lane 1	0.0	0.0	0.0	0.0
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LANE SUMMARY

Site: 101 [Int 4: Hendriske Road / Rhode Road_AM Peak (Site Folder: 2023 AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Give-Way (Two-Way)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue	Dist	Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	m		m	% %
South: Rhode Road														
Lane 1	20	0.0	20	0.0	1263	0.016	100	5.9	LOS A	0.1	0.4	Full	500	0.0 0.0
Approach	20	0.0	20	0.0		0.016		5.9	LOS A	0.1	0.4			
East: Hendriske Road														
Lane 1	59	0.0	59	0.0	1919	0.031	100	1.8	LOS A	0.0	0.0	Full	500	0.0 0.0
Approach	59	0.0	59	0.0		0.031		1.8	NA	0.0	0.0			
West: Hendriske Road														
Lane 1	132	0.0	132	0.0	1941	0.068	100	0.1	LOS A	0.0	0.1	Full	500	0.0 0.0
Approach	132	0.0	132	0.0		0.068		0.1	NA	0.0	0.1			
All Vehicles	211	0.0	211	0.0		0.068		1.1	NA	0.1	0.4			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Rhode Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit:	W	E			veh/h	v/c	%	%	
Lane 1	8	12	20	0.0	1263	0.016	100	NA	NA
Approach	8	12	20	0.0		0.016			

East: Hendriske Road

Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit:	S	W			veh/h	v/c	%	%	
Lane 1	19	40	59	0.0	1919	0.031	100	NA	NA
Approach	19	40	59	0.0		0.031			

West: Hendriske Road

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From W To Exit:	E	S			veh/h	v/c	%	%	
Lane 1	128	3	132	0.0	1941	0.068	100	NA	NA

Approach	128	3	132	0.0	0.068
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Route	%H/M/D	Capacity	(V/C)
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All Vehicles	211	0.0	0.068
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Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Opposing Lane	Opposing Flow Rate %veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
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South: Rhode Road

Lane 1	0.0	0.0	0.0	0.0
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East: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

West: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
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LANE SUMMARY

Site: [Int 5: Lang Road / Gabriels Road_AM Peak (Site Folder: 2023 AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Sat'n	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h	HV %	[Total veh/h	HV %						[Veh	Dist m				
South: Lang Road															
Lane 1	239	0.0	239	0.0	1024	0.233	100	10.2	LOS B	0.7	5.0	Full	500	0.0	0.0
Approach	239	0.0	239	0.0		0.233		10.2	LOS B	0.7	5.0				
East: Gabriels Road															
Lane 1	40	0.0	40	0.0	244	0.164	100	23.5	LOS C	0.6	4.1	Full	500	0.0	0.0
Approach	40	0.0	40	0.0		0.164		23.5	LOS C	0.6	4.1				
North: Lang Road															
Lane 1	632	0.7	632	0.7	1138	0.555	100	12.7	LOS B	2.6	18.5	Full	500	0.0	0.0
Approach	632	0.7	632	0.7		0.555		12.7	LOS B	2.6	18.5				
All Vehicles	911	0.5	911	0.5		0.555		12.6	LOS B	2.6	18.5				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)									
South: Lang Road									
Mov.	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From S To Exit:	N	E			veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	232	7	239	0.0	1024	0.233	100	NA	NA
Approach	232	7	239	0.0		0.233			
East: Gabriels Road									
Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From E To Exit:	S	N			veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	32	8	40	0.0	244	0.164	100	NA	NA
Approach	32	8	40	0.0		0.164			
North: Lang Road									
Mov.	L2	T1	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From N To Exit:	E	S			veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	7	624	632	0.7	1138	0.555	100	NA	NA
Approach	7	624	632	0.7		0.555			
Total %HV/Deg. Satn (v/c)									

All Vehicles 911 0.5 0.555

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppng in Lane	Flow Rate %veh/h pcu/h	Initial Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
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South: Lang Road

Lane 1	0.0	0.0	0.0	0.0
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East: Gabriels Road

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

North: Lang Road

Lane 1	0.0	0.0	0.0	0.0
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LANE SUMMARY

Site: [Int 6: Welgevonden Blvd / Lang Road_AM Peak (Site Folder: 2023 AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (Two-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.	
	[Total	HV]	[Total	HV]						[Veh	Dist]			%	%
	veh/h	%	veh/h	%						veh/h	v/c			%	sec
South: Lang Road															
Lane 1	137	1.5	137	1.5	1179	0.116	100	8.8	LOS A	0.5	3.4	Full	500	0.0	0.0
Approach	137	1.5	137	1.5		0.116		8.8	LOS A	0.5	3.4				
East: Welgevonden Blvd															
Lane 1	113	0.0	113	0.0	1938	0.058	100	0.7	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	113	0.0	113	0.0		0.058		0.7	NA	0.0	0.0				
West: Welgevonden Blvd															
Lane 1	513	1.4	513	1.4	1633	0.314	100	5.5	LOS A	1.8	13.0	Full	500	0.0	0.0
Approach	513	1.4	513	1.4		0.314		5.5	NA	1.8	13.0				
All Vehicles	762	1.2	762	1.2		0.314		5.4	NA	1.8	13.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)										
South: Lang Road										
Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From S To Exit:	W	E								
Lane 1	129	7	137	1.5	1179	0.116	100	NA	NA	
Approach	129	7	137	1.5		0.116				
East: Welgevonden Blvd										
Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From E To Exit:	S	W								
Lane 1	14	99	113	0.0	1938	0.058	100	NA	NA	
Approach	14	99	113	0.0		0.058				
West: Welgevonden Blvd										
Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From W To Exit:	E	S								
Lane 1	39	474	513	1.4	1633	0.314	100	NA	NA	

Approach 39 474 513 1.4 0.314

Total 762 1.2 0.314

All Vehicles 762 1.2 0.314

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppg in Lane	Opposing Flow Rate %veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
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South: Lang Road

Lane 1 0.0 0.0 0.0 0.0

East: Welgevonden Blvd

Lane 1 0.0 0.0 0.0 0.0

West: Welgevonden Blvd

Lane 1 0.0 0.0 0.0 0.0

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LANE SUMMARY

Site: Int7 [Int 7: R304 / Welgevonden Blvd_AM Peak (Site Folder: 2023 AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total	HV]	[Total	HV]	veh/h	v/c	%	sec		[Veh	Dist]		m	%	%
	veh/h	%	veh/h	%							m				
South: R304															
Lane 1	604	2.4	604	2.4	1130	0.535	100	11.8	LOS B	15.8	112.8	Full	500	0.0	0.0
Lane 2	155	0.0	155	0.0	279	0.554	100	21.3	LOS C	4.0	27.9	Short	70	0.0	NA
Approach	759	1.9	759	1.9		0.554		13.8	LOS B	15.8	112.8				
East: Welgevonden Blvd															
Lane 1	68	0.0	68	0.0	516	0.133	100	31.9	LOS C	2.3	15.8	Short	45	0.0	NA
Lane 2	186	0.0	186	0.0	268	0.695	100	47.7	LOS D	8.3	58.0	Full	500	0.0	0.0
Approach	255	0.0	255	0.0		0.695		43.4	LOS D	8.3	58.0				
North: R304															
Lane 1	299	0.7	299	0.7	1088	0.275	100	16.2	LOS B	6.4	44.8	Short	100	0.0	NA
Lane 2	826	3.2	826	3.2	1086 ¹	0.761	100	15.7	LOS B	26.9	193.1	Full	500	0.0	0.0
Approach	1125	2.5	1125	2.5		0.761		15.8	LOS B	26.9	193.1				
All Vehicles	2139	2.0	2139	2.0		0.761		18.4	LOS B	26.9	193.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)

South: R304

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit:	N	E			veh/h	v/c	%	%	
Lane 1	604	-	604	2.4	1130	0.535	100	NA	NA
Lane 2	-	155	155	0.0	279	0.554	100	0.0	1
Approach	604	155	759	1.9		0.554			

East: Welgevonden Blvd

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit:	S	N			veh/h	v/c	%	%	
Lane 1	68	-	68	0.0	516	0.133	100	0.0	2
Lane 2	-	186	186	0.0	268	0.695	100	NA	NA
Approach	68	186	255	0.0		0.695			

North: R304

Mov. From N To Exit	L2 E	T1 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	299	-	299	0.7	1088	0.275	100	0.0	2
Lane 2	-	826	826	3.2	1086 ¹	0.761	100	NA	NA
Approach	299	826	1125	2.5		0.761			
Total %HV Deg Satn (v/c)									
All Vehicles	2139	2.0		0.761					

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Opposing Flow Rate %veh/h pcu/h	Critical Gap sec	Follow-up Headway Rate sec veh/h	Lane Capacity Flow veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
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South: R304

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

East: Welgevonden Blvd

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

North: R304

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [Int 8: R44 / Fir Street_AMPeak (Site Folder: 2023 AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (Two-Way)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
South: R44															
Lane 1	552	3.7	552	3.7	1895	0.291	100	0.6	LOS A	0.0	0.0	Full	490	0.0	0.0
Lane 2	553	4.1	553	4.1	1899	0.291	100	0.1	LOS A	0.0	0.0	Full	490	0.0	0.0
Approach	1105	3.9	1105	3.9		0.291		0.4	NA	0.0	0.0				
North: R44															
Lane 1	1010	2.2	1010	2.2	1922	0.525	100	0.5	LOS A	0.0	0.0	Full	1150	0.0	0.0
Lane 2	1010	2.2	1010	2.2	1922	0.525	100	0.5	LOS A	0.0	0.0	Full	1150	0.0	0.0
Lane 3	56	0.0	56	0.0	363	0.154	100	15.0	LOS C	0.5	3.7	Short	60	0.0	NA
Approach	2076	2.2	2076	2.2		0.525		0.9	NA	0.5	3.7				
West: Fir Street															
Lane 1	255	0.8	255	0.8	7	39.15	100	34526.6	LOS F	156.2	1101.1	Full	260	0.0	100.0
Approach	255	0.8	255	0.8		39.15		34526.6	LOS F	156.2	1101.1				
All Vehicles	3436	2.6	3436	2.6		39.15		2560.5	NA	156.2	1101.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: R44

Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov. Lane
From S To Exit	W	N			veh/h	v/c	%	%	No.
Lane 1	54	498	552	3.7	1895	0.291	100	NA	NA
Lane 2	-	553	553	4.1	1899	0.291	100	NA	NA
Approach	54	1052	1105	3.9		0.291			

North: R44

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov. Lane
From N To Exit	S	W			veh/h	v/c	%	%	No.
Lane 1	1010	-	1010	2.2	1922	0.525	100	NA	NA
Lane 2	1010	-	1010	2.2	1922	0.525	100	NA	NA

Lane 3	-	56	56	0.0	363	0.154	100	0.0	2
Approach	2020	56	2076	2.2	0.525				

West: Fir Street

Mov.	L2	R2	Total	%HV	Gap	Deg. Satn	Lane Util	Prob. SL Ov.	Ov. Lane No.
From W To Exit:	N	S			veh/h	v/c	%	%	
Lane 1	20	235	255	0.8	7	39.154	100	NA	NA
Approach	20	235	255	0.8	39.154				

All Vehicles 3436 2.6 39.154

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length	Percent Oppng In Lane	Flow Rate	Critical Gap	Follow-up Headway	Lane Capacity	Deg. Satn	Min. Delay	Merge Delay
	m	%	veh/h pcu/h	sec	sec	veh/h	v/c	sec	sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial Queued Demand	Residual Queued Demand	Time for Residual Demand to Clear	Duration of Oversatn
	veh	veh	sec	sec

South: R44

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

North: R44

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

West: Fir Street

Lane 1	0.0	124.1	68676.5	NA
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LANE SUMMARY

Site: 101v [Int 8: R44 / Fir Street_AMPeak - Conversion (Site Folder: 2023 AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
South: R44															
Lane 1	553	3.7	553	3.7	1310	0.422	100	7.0	LOS A	10.3	74.1	Full	490	0.0	0.0
Lane 2	552	4.1	552	4.1	1308	0.422	100	6.5	LOS A	10.5	76.1	Full	490	0.0	0.0
Approach	1105	3.9	1105	3.9		0.422		6.8	LOS A	10.5	76.1				
North: R44															
Lane 1	1064	2.2	1064	2.2	1324	0.804	100	10.4	LOS B	32.2	229.9	Full	1150	0.0	0.0
Lane 2	956	2.2	956	2.2	1190 ¹	0.804	100	15.4	LOS B	29.7	211.7	Full	1150	0.0	0.0
Lane 3	56	0.0	56	0.0	276	0.202	100	20.5	LOS C	1.3	8.8	Short	60	0.0	NA
Approach	2076	2.2	2076	2.2		0.804		13.0	LOS B	32.2	229.9				
West: Fir Street															
Lane 1	255	0.8	255	0.8	328	0.776	100	47.8	LOS D	11.6	82.0	Full	260	0.0	0.0
Approach	255	0.8	255	0.8		0.776		47.8	LOS D	11.6	82.0				
All Vehicles	3436	2.6	3436	2.6		0.804		13.6	LOS B	32.2	229.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay; Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)

South: R44

Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit:	W	N			veh/h	v/c	%	%	
Lane 1	54	499	553	3.7	1310	0.422	100	NA	NA
Lane 2	-	552	552	4.1	1308	0.422	100	NA	NA
Approach	54	1052	1105	3.9		0.422			

North: R44

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From N To Exit:	S	W			veh/h	v/c	%	%	
Lane 1	1064	-	1064	2.2	1324	0.804	100	NA	NA
Lane 2	956	-	956	2.2	1190 ¹	0.804	100	NA	NA
Lane 3	-	56	56	0.0	276	0.202	100	0.0	2

Approach 2020 56 2076 2.2 0.804

West: Fir Street

Mov.	L2	R2	Total	%HV	Gap	Deg.	Lane	Prob.	Ov.
From W To Exit:	N	S			veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	20	235	255	0.8	328	0.776	100	NA	NA
Approach	20	235	255	0.8		0.776			
	Total	%HV	Deg.	Satn (v/c)					
All Vehicles	3436	2.6		0.804					

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppg in Lane	Opposing Flow Rate % veh/h per/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Fir Street				
Lane 1	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: [Int 1: R44 / Hendriske Road_PM Peak (Site Folder: 2023 PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	% %
South: R44														
Lane 1	372	0.0	372	0.0	1388	0.268	100	6.8	LOS A	2.3	16.1	Short	120	0.0 NA
Lane 2	836	4.2	836	4.2	1097	0.762	100	15.3	LOS B	27.5	199.6	Full	500	0.0 0.0
Approach	1207	2.9	1207	2.9		0.762		12.7	LOS B	27.5	199.6			
North: R44														
Lane 1	478	3.5	478	3.5	1356	0.353	100	5.3	LOS A	8.0	57.5	Full	500	0.0 0.0
Lane 2	85	0.0	85	0.0	306	0.279	100	19.0	LOS B	1.8	12.4	Short	80	0.0 NA
Approach	563	3.0	563	3.0		0.353		7.4	LOS A	8.0	57.5			
West: Hendriske Road														
Lane 1	52	0.0	52	0.0	537	0.096	100	44.1	LOS D	1.7	11.6	Short	20	0.0 NA
Lane 2	191	1.1	191	1.1	260 ¹	0.733	100	61.4	LOS E	8.6	60.7	Full	500	0.0 0.0
Approach	242	0.9	242	0.9		0.733		57.7	LOS E	8.6	60.7			
All Vehicles	2013	2.7	2013	2.7		0.762		16.6	LOS B	27.5	199.6			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)

South: R44

Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit	W	N			veh/h	v/c	%	%	
Lane 1	372	-	372	0.0	1388	0.268	100	0.0	2
Lane 2	-	836	836	4.2	1097	0.762	100	NA	NA
Approach	372	836	1207	2.9		0.762			

North: R44

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From N To Exit	S	W			veh/h	v/c	%	%	
Lane 1	478	-	478	3.5	1356	0.353	100	NA	NA
Lane 2	-	85	85	0.0	306	0.279	100	0.0	1
Approach	478	85	563	3.0		0.353			

West: Hendriske Road

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From W To Exit	N	S			veh/h	Satn v/c	Util. SL %	SL Ov. %	Lane No.
Lane 1	52	-	52	0.0	537	0.096	100	0.0	2
Lane 2	-	191	191	1.1	260 ¹	0.733	100	NA	NA
Approach	52	191	242	0.9		0.733			
Total									
All Vehicles 2013 2.7 0.762									

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppng in Lane	Flow Rate %veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
West: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

**Site: Int1 [Int 1: R44 / Hendriske Road_PM Peak_Upgraded
(Site Folder: 2023 PM Peak)]**

Output produced by **SIDRA INTERSECTION** Version: **9.1.6.228**

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
South: R44															
Lane 1	372	0.0	372	0.0	1375	0.270	100	11.3	LOS B	2.5	17.6	Short	80	0.0	NA
Lane 2	836	4.2	836	4.2	1042 ¹	0.802	100	26.3	LOS C	27.9	202.1	Full	500	0.0	0.0
Lane 3	1	0.0	1	0.0	282	0.004	100	27.8	LOS C	0.0	0.2	Short	45	0.0	NA
Approach	1208	2.9	1208	2.9		0.802		21.7	LOS C	27.9	202.1				
East: RoadName															
Lane 1	2	0.0	2	0.0	246	0.009	100	37.0	LOS D	0.1	0.5	Full	500	0.0	0.0
Approach	2	0.0	2	0.0		0.009		37.0	LOS D	0.1	0.5				
North: R44															
Lane 1	557	1.8	557	1.8	1349	0.413	100	5.4	LOS A	9.1	64.5	Full	500	0.0	0.0
Lane 2	356	1.8	356	1.8	1349	0.264	64 ⁶	7.2	LOS A	5.0	35.9	Full	500	0.0	0.0
Lane 3	85	0.0	85	0.0	308	0.277	100	27.7	LOS C	2.6	18.2	Short	80	0.0	NA
Approach	998	1.7	998	1.7		0.413		7.9	LOS A	9.1	64.5				
West: Hendriske Road															
Lane 1	52	0.0	52	0.0	557	0.093	100	38.4	LOS D	1.5	10.2	Short	20	0.0	NA
Lane 2	191	1.1	191	1.1	234 ¹	0.814	100	58.9	LOS E	8.2	58.1	Full	500	0.0	0.0
Approach	242	0.9	242	0.9		0.814		54.5	LOS D	8.2	58.1				
All Vehicles	2451	2.2	2451	2.2		0.814		19.3	LOS B	27.9	202.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

⁶ Lane under-utilisation due to downstream effects

Approach Lane Flows (veh/h)

South: R44

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From/S To/Exit:	W	N	E			veh/h	v/c	%	%	
Lane 1	372	-	-	372	0.0	1375	0.270	100	0.0	2
Lane 2	-	836	-	836	4.2	1042 ¹	0.802	100	NA	NA
Lane 3	-	-	1	1	0.0	282	0.004	100	0.0	2
Approach	372	836	1	1208	2.9		0.802			

East: RoadName

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From E					veh/h	Satn	Util.	SL Ov.	Lane
To Exit:	S	N				v/c	%	%	No.
Lane 1	1	1	2	0.0	246	0.009	100	NA	NA
Approach	1	1	2	0.0		0.009			

North: R44

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From N						veh/h	Satn	Util.	SL Ov.	Lane
To Exit:	E	S	W				v/c	%	%	No.
Lane 1	1	556	-	557	1.8	1349	0.413	100	NA	NA
Lane 2	-	356	-	356	1.8	1349	0.264	64 ⁶	NA	NA
Lane 3	-	-	85	85	0.0	308	0.277	100	0.0	2
Approach	1	912	85	998	1.7		0.413			

West: Hendriske Road

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From W					veh/h	Satn	Util.	SL Ov.	Lane
To Exit:	N	S				v/c	%	%	No.
Lane 1	52	-	52	0.0	557	0.093	100	0.0	2
Lane 2	-	191	191	1.1	234 ¹	0.814	100	NA	NA
Approach	52	191	242	0.9		0.814			
Total									

All Vehicles 2451 2.2 0.814

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.
- 6 Lane under-utilisation due to downstream effects

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Opposing Lane	Opposing Flow Rate % veh/h per/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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South Exit: R44

Merge Type: Priority

Exit Short Lane	2	120	0.0	652	658	3.03	2.02	451	1102 0.410	1.3	2.5
Merge Lane	1	-	100.0	Merge Lane is not Opposed				652	1800 0.362	0.0	0.0

North Exit: R44

Merge Type: Priority

Exit Short Lane	1	60	0.0	863	880	3.00	2.00	26	883 0.029	2.0	2.3
Merge Lane	2	-	100.0	Merge Lane is not Opposed				863	1800 0.479	0.0	0.0

Variable Demand Analysis

Initial Queued Demand	Residual Queued Demand	Time for Residual Demand to Clear	Duration of Oversatn
veh	veh	sec	sec

South: R44

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

East: RoadName

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

North: R44

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

West: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

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LANE SUMMARY

Site: Int1 [Int 1: R44 / Hendriske Road_PM
Peak_NextUpgraded (Site Folder: 2023 PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Sain	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	vc	%	sec		[Veh]	[Dist] m		m	% %
South: R44														
Lane 1	372	0.0	372	0.0	1329	0.280	100	7.0	LOS A	2.1	14.6	Short	80	0.0 NA
Lane 2	233	4.2	233	4.2	918	0.254	35 ⁶	14.0	LOS B	4.0	29.3	Full	500	0.0 0.0
Lane 3	604	4.1	604	4.1	843 ¹	0.716	100	16.4	LOS B	14.6	105.8	Short	45	0.0 NA
Approach	1208	2.9	1208	2.9		0.716		13.0	LOS B	14.6	105.8			
East: RoadName														
Lane 1	2	0.0	2	0.0	183	0.011	100	31.8	LOS C	0.1	0.4	Full	500	0.0 0.0
Approach	2	0.0	2	0.0		0.011		31.8	LOS C	0.1	0.4			
North: R44														
Lane 1	557	1.8	557	1.8	1317	0.423	100	4.6	LOS A	7.3	51.6	Full	500	0.0 0.0
Lane 2	356	1.8	356	1.8	1317	0.270	64 ⁶	6.4	LOS A	4.0	28.7	Full	500	0.0 0.0
Lane 3	85	0.0	85	0.0	399	0.214	100	19.0	LOS B	1.7	12.1	Short	80	0.0 NA
Approach	998	1.7	998	1.7		0.423		6.4	LOS A	7.3	51.6			
West: Hendriske Road														
Lane 1	140	0.7	140	0.7	203	0.687	100	36.4	LOS D	4.3	30.6	Short	20	0.0 NA
Lane 2	103	1.1	103	1.1	222	0.461	67 ⁶	36.6	LOS D	3.0	21.3	Full	500	0.0 0.0
Approach	242	0.9	242	0.9		0.687		36.5	LOS D	4.3	30.6			
All Vehicles	2451	2.2	2451	2.2		0.716		12.7	LOS B	14.6	105.8			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.

Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

⁶ Lane under-utilisation due to downstream effects

Approach Lane Flows (veh/h)

South: R44

Mov.	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Sain v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From S to Exit	W	N	E							
Lane 1	372	-	-	372	0.0	1329	0.280	100	0.0	2
Lane 2	-	233	-	233	4.2	918	0.254	35 ⁶	NA	NA
Lane 3	-	603	1	604	4.1	843 ¹	0.716	100	85.1	2
Approach	372	836	1	1208	2.9		0.716			

East: RoadName

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From E					veh/h	Satn	Util.	SL Ov.	Lane
To Exit:	S	N				v/c	%	%	No.
Lane 1	1	1	2	0.0	183	0.011	100	NA	NA
Approach	1	1	2	0.0		0.011			

North: R44

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From N						veh/h	Satn	Util.	SL Ov.	Lane
To Exit:	E	S	W				v/c	%	%	No.
Lane 1	1	556	-	557	1.8	1317	0.423	100	NA	NA
Lane 2	-	356	-	356	1.8	1317	0.270	64 ⁶	NA	NA
Lane 3	-	-	85	85	0.0	399	0.214	100	0.0	2
Approach	1	912	85	998	1.7		0.423			

West: Hendriske Road

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From W					veh/h	Satn	Util.	SL Ov.	Lane
To Exit:	N	S				v/c	%	%	No.
Lane 1	52	88	140	0.7	203	0.687	100	43.8	2
Lane 2	-	103	103	1.1	222	0.461	67 ⁶	NA	NA
Approach	52	191	242	0.9		0.687			

Total	%HV	Deg.	Satn (v/c)
All Vehicles	2451	2.2	0.716

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand, and Upstream Capacity Constraint effects.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.
- 6 Lane under-utilisation due to downstream effects

Merge Analysis

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Oppg in Lane %	Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: R44												
Merge Type: Priority												
Exit Short Lane	2	120	0.0	645	650	3.03	2.02	459	1110	0.413	1.2	2.4
Merge Lane	1	-	100.0	Merge Lane is not Opposed				645	1800	0.358	0.0	0.0
North Exit: R44												
Merge Type: Priority												
Exit Short Lane	1	60	0.0	630	642	3.06	2.04	259	1097	0.236	1.3	1.8
Merge Lane	2	-	100.0	Merge Lane is not Opposed				630	1800	0.350	0.0	0.0

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
East: RoadName				
Lane 1	0.0	0.0	0.0	0.0

North: R44

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

West: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

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LANE SUMMARY

Site: [Int 2: Hendriske Road / Tolbos Road_PM Peak (Site Folder: 2023 PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
South: Hendriske Road															
Lane 1	89	1.2	89	1.2	569	0.157	100	13.2	LOS B	0.5	3.7	Full	500	0.0	0.0
Approach	89	1.2	89	1.2		0.157		13.2	LOS B	0.5	3.7				
East: Tolbos Road															
Lane 1	51	0.0	51	0.0	497	0.102	100	13.5	LOS B	0.3	2.3	Full	500	0.0	0.0
Approach	51	0.0	51	0.0		0.102		13.5	LOS B	0.3	2.3				
North: Hendriske Road															
Lane 1	232	0.0	232	0.0	602	0.385	100	15.4	LOS C	1.6	11.0	Full	500	0.0	0.0
Approach	232	0.0	232	0.0		0.385		15.4	LOS C	1.6	11.0				
West: Tolbos Road															
Lane 1	1	0.0	1	0.0	1	1.000 ⁴	100	4165.9	LOS F	2.2	15.4	Full	500	0.0	0.0
Approach	1	0.0	1	0.0		1.000		4165.9	LOS F	2.2	15.4				
All Vehicles	373	0.3	373	0.3		1.000		26.4	LOS D	2.2	15.4				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

⁴ x = 1.00 due to minimum capacity

Approach Lane Flows (veh/h)

South: Hendriske Road

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit:	N	E			veh/h	v/c	%	%	
Lane 1	82	7	89	1.2	569	0.157	100	NA	NA
Approach	82	7	89	1.2		0.157			

East: Tolbos Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit:	S	N			veh/h	v/c	%	%	
Lane 1	2	48	51	0.0	497	0.102	100	NA	NA
Approach	2	48	51	0.0		0.102			

North: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From N To Exit:	E	S	W			veh/h	v/c	%	%	

Lane 1	75	154	3	232	0.0	602	0.385	100	NA	NA
Approach	75	154	3	232	0.0		0.385			

West: Tolbos Road

Mov.	L2	Total	%HV			Cap.	Deg.	Lane	Prob.	Op.
From W						veh/h	Satn	Util	SL	OV
To Exit	N						v/c	%	%	Lane
Lane 1	1	1	0.0			1	1.000 ⁴	100	NA	NA
Approach	1	1	0.0				1.000			
	Total	%HV	Deg.	Satn	(v/c)					
All Vehicles	373	0.3		1.000						

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

⁴ x = 1.00 due to minimum capacity

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppng In Lane	Opposing Flow Rate %veh/h pcut/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0
East: Tolbos Road				
Lane 1	0.0	0.0	0.0	0.0
North: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0
West: Tolbos Road				
Lane 1	0.0	0.0	0.0	NA

LANE SUMMARY

Site: [Int 3: Hendriske Road / Williams Road_PM Peak (Site Folder: 2023 PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist]		m	%	%
South: Williams Road															
Lane 1	32	0.0	32	0.0	371	0.085	100	16.1	LOS C	0.3	2.0	Full	500	0.0	0.0
Approach	32	0.0	32	0.0		0.085		16.1	LOS C	0.3	2.0				
East: Hendriske Road															
Lane 1	155	0.0	155	0.0	648	0.239	100	13.0	LOS B	0.8	5.8	Full	500	0.0	0.0
Approach	155	0.0	155	0.0		0.239		13.0	LOS B	0.8	5.8				
West: RoadName															
Lane 1	71	3.0	71	3.0	624	0.113	100	12.3	LOS B	0.4	2.5	Full	500	0.0	0.0
Approach	71	3.0	71	3.0		0.113		12.3	LOS B	0.4	2.5				
All Vehicles	257	0.8	257	0.8		0.239		13.2	LOS B	0.8	5.8				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab). Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Williams Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit:	W	E			veh/h	v/c	%	%	
Lane 1	4	27	32	0.0	371	0.085	100	NA	NA
Approach	4	27	32	0.0		0.085			

East: Hendriske Road

Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit:	S	W			veh/h	v/c	%	%	
Lane 1	43	112	155	0.0	648	0.239	100	NA	NA
Approach	43	112	155	0.0		0.239			

West: RoadName

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From W To Exit:	E	S			veh/h	v/c	%	%	
Lane 1	64	6	71	3.0	624	0.113	100	NA	NA
Approach	64	6	71	3.0		0.113			

Total %HV/Deg. Satn (v/c)

All Vehicles 257 0.8 0.239

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis										
Exit Lane Number	Short Lane Length m	Percent Oppg in Lane	Opposing Flow Rate % veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis				
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec

South: Williams Road

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

East: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

West: RoadName

Lane 1	0.0	0.0	0.0	0.0
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LANE SUMMARY

▼ Site: 101 [Int 4: Hendriske Road / Rhode Road_PM Peak (Site Folder: 2023 PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Give-Way (Two-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Sat'n	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob.	
	[Total	HV]	[Total	HV]						[Veh	Dist]			Adj.	Block.
	veh/h	%	veh/h	%						veh/h	v/c			%	sec
South: Rhode Road															
Lane 1	19	0.0	19	0.0	1255	0.015	100	5.9	LOS A	0.1	0.4	Full	500	0.0	0.0
Approach	19	0.0	19	0.0		0.015		5.9	LOS A	0.1	0.4				
East: Hendriske Road															
Lane 1	114	0.0	114	0.0	1920	0.059	100	1.8	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	114	0.0	114	0.0		0.059		1.8	NA	0.0	0.0				
West: Hendriske Road															
Lane 1	62	3.4	62	3.4	1887	0.033	100	0.3	LOS A	0.0	0.1	Full	500	0.0	0.0
Approach	62	3.4	62	3.4		0.033		0.3	NA	0.0	0.1				
All Vehicles	195	1.1	195	1.1		0.059		1.7	NA	0.1	0.4				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Rhode Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit:	W	E			veh/h	v/c	%	%	
Lane 1	7	12	19	0.0	1255	0.015	100	NA	NA
Approach	7	12	19	0.0		0.015			

East: Hendriske Road

Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit:	S	W			veh/h	v/c	%	%	
Lane 1	36	78	114	0.0	1920	0.059	100	NA	NA
Approach	36	78	114	0.0		0.059			

West: Hendriske Road

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From W To Exit:	E	S			veh/h	v/c	%	%	
Lane 1	59	3	62	3.4	1887	0.033	100	NA	NA

Approach	59	3	62	3.4	0.033
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Total	195	1.1	0.059
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All Vehicles	195	1.1	0.059
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Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppng in Lane	Opposing Flow Rate %veh/h, pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversat sec
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South: Rhode Road

Lane 1	0.0	0.0	0.0	0.0
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East: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
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West: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
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Project: C:\Users\Armandt.VanStraten\Zutari\1001918 - Cloetesville - Documents\05 Deliver\510 Reports\2. Status Quo Analysis\Status Quo_Transport\Sidra Analysis\1001918-Cloetesville.sip9

LANE SUMMARY

Site: [Int 5: Lang Road / Gabriels Road_PM Peak (Site Folder: 2023 PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist] m		m	% %
South: Lang Road														
Lane 1	340	0.3	340	0.3	1197	0.284	100	9.9	LOS A	0.9	6.1	Full	500	0.0 0.0
Approach	340	0.3	340	0.3		0.284		9.9	LOS A	0.9	6.1			
East: Gabriels Road														
Lane 1	8	0.0	8	0.0	204	0.041	100	24.3	LOS C	0.1	1.0	Full	500	0.0 0.0
Approach	8	0.0	8	0.0		0.041		24.3	LOS C	0.1	1.0			
North: Lang Road														
Lane 1	208	1.5	208	1.5	1100	0.190	100	9.8	LOS A	0.5	3.8	Full	500	0.0 0.0
Approach	208	1.5	208	1.5		0.190		9.8	LOS A	0.5	3.8			
All Vehicles	557	0.8	557	0.8		0.284		10.0	LOS B	0.9	6.1			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Lang Road

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SLOv.	OV. Lane No.
From S To Exit	N	E			veh/h	v/c	%	%	
Lane 1	319	21	340	0.3	1197	0.284	100	NA	NA
Approach	319	21	340	0.3		0.284			

East: Gabriels Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SLOv.	OV. Lane No.
From E To Exit	S	N			veh/h	v/c	%	%	
Lane 1	7	1	8	0.0	204	0.041	100	NA	NA
Approach	7	1	8	0.0		0.041			

North: Lang Road

Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SLOv.	OV. Lane No.
From N To Exit	E	S			veh/h	v/c	%	%	
Lane 1	2	206	208	1.5	1100	0.190	100	NA	NA
Approach	2	206	208	1.5		0.190			

Total %HV Deg. Satn (v/c)

All Vehicles 557 0.8 0.284

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppg in Lane	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
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South: Lang Road

Lane 1	0.0	0.0	0.0	0.0
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East: Gabriels Road

Lane 1	0.0	0.0	0.0	0.0
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North: Lang Road

Lane 1	0.0	0.0	0.0	0.0
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LANE SUMMARY

Site: [Int 6: Welgevonden Blvd / Lang Road_PM Peak (Site Folder: 2023 PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (Two-Way)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist. m]		m	% %
South: Lang Road														
Lane 1	222	0.0	222	0.0	1318	0.168	100	8.3	LOS A	0.7	5.2	Full	500	0.0 0.0
Approach	222	0.0	222	0.0		0.168		8.3	LOS A	0.7	5.2			
East: Welgevonden Blvd														
Lane 1	74	0.0	74	0.0	1936	0.038	100	0.8	LOS A	0.0	0.0	Full	500	0.0 0.0
Approach	74	0.0	74	0.0		0.038		0.8	NA	0.0	0.0			
West: Welgevonden Blvd														
Lane 1	232	0.0	232	0.0	1765	0.131	100	3.5	LOS A	0.6	4.5	Full	500	0.0 0.0
Approach	232	0.0	232	0.0		0.131		3.5	NA	0.6	4.5			
All Vehicles	527	0.0	527	0.0		0.168		5.2	NA	0.7	5.2			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)										
South: Lang Road										
Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From S To Exit:	W	E			veh/h	v/c	%	%	No.	
Lane 1	211	12	222	0.0	1318	0.168	100	NA	NA	
Approach	211	12	222	0.0		0.168				
East: Welgevonden Blvd										
Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From E To Exit:	S	W			veh/h	v/c	%	%	No.	
Lane 1	11	63	74	0.0	1936	0.038	100	NA	NA	
Approach	11	63	74	0.0		0.038				
West: Welgevonden Blvd										
Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov. Lane	
From W To Exit:	E	S			veh/h	v/c	%	%	No.	
Lane 1	92	140	232	0.0	1765	0.131	100	NA	NA	

Approach	92	140	232	0.0	0.131
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Total	527	0.0	0.168
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All Vehicles	527	0.0	0.168
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Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppng in Lane	Flow Rate %veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
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South: Lang Road

Lane 1	0.0	0.0	0.0	0.0
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East: Welgevonden Blvd

Lane 1	0.0	0.0	0.0	0.0
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West: Welgevonden Blvd

Lane 1	0.0	0.0	0.0	0.0
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LANE SUMMARY

Site: Int7 [Int 7: R304 / Welgevonden Blvd_PM Peak (Site Folder: 2023 PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total]	HV]	[Total]	HV]	veh/h	v/c	%	sec		[Veh]	[Dist]		m	%	%
	veh/h	%	veh/h	%							m				
South: R304															
Lane 1	1057	3.4	1057	3.4	1280 ¹	0.826	100	23.7	LOS C	45.6	328.7	Full	500	0.0	0.0
Lane 2	115	0.0	115	0.0	436	0.263	100	21.6	LOS C	1.7	11.8	Short	70	0.0	NA
Approach	1172	3.1	1172	3.1		0.826		23.5	LOS C	45.6	328.7				
East: Welgevonden Blvd															
Lane 1	87	0.0	87	0.0	357	0.245	100	53.7	LOS D	4.7	33.1	Short	45	0.0	NA
Lane 2	153	0.0	153	0.0	186	0.822	100	74.4	LOS E	10.4	72.7	Full	500	0.0	0.0
Approach	240	0.0	240	0.0		0.822		66.8	LOS E	10.4	72.7				
North: R304															
Lane 1	156	0.0	156	0.0	1329	0.117	100	11.5	LOS B	3.0	20.9	Short	100	0.0	NA
Lane 2	653	0.8	653	0.8	1388	0.470	100	8.3	LOS A	17.3	122.2	Full	500	0.0	0.0
Approach	808	0.7	808	0.7		0.470		9.0	LOS A	17.3	122.2				
All Vehicles	2220	1.8	2220	1.8		0.826		22.9	LOS C	45.6	328.7				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)

South: R304

Mov.	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From S					veh/h	Satn	Util.	SL Ov.	Lane
To Exit:	N	E				v/c	%	%	No.
Lane 1	1057	-	1057	3.4	1280 ¹	0.826	100	NA	NA
Lane 2	-	115	115	0.0	436	0.263	100	0.0	1
Approach	1057	115	1172	3.1		0.826			

East: Welgevonden Blvd

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From E					veh/h	Satn	Util.	SL Ov.	Lane
To Exit:	S	N				v/c	%	%	No.
Lane 1	87	-	87	0.0	357	0.245	100	0.0	2
Lane 2	-	153	153	0.0	186	0.822	100	NA	NA
Approach	87	153	240	0.0		0.822			

North: R304

Mov.	L2	T1	Total	%HV	Cap.	Deg.	Lane	Prob.	Qv.
From N To Exit:	E	S			veh/h	Satn v/c	Util. SL %	ov. %	Lane No.
Lane 1	156	-	156	0.0	1329	0.117	100	0.0	2
Lane 2	-	653	653	0.8	1388	0.470	100	NA	NA
Approach	156	653	808	0.7		0.470			
Total %HV/Deg. Satn (v/c)									
All Vehicles	2220	1.8		0.826					

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppg in Lane	Flow Rate %veh/h per h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: R304				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
East: Welgevonden Blvd				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: R304				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [Int 8: R44 / Fir Street_PMPeak (Site Folder: 2023 PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (Two-Way)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
South: R44															
Lane 1	824	3.1	824	3.1	1889	0.436	100	1.5	LOS A	0.0	0.0	Full	490	0.0	0.0
Lane 2	829	3.9	829	3.9	1902	0.436	100	0.2	LOS A	0.0	0.0	Full	490	0.0	0.0
Approach	1653	3.5	1653	3.5		0.436		0.8	NA	0.0	0.0				
North: R44															
Lane 1	644	4.3	644	4.3	1897	0.340	100	0.2	LOS A	0.0	0.0	Full	1150	0.0	0.0
Lane 2	644	4.3	644	4.3	1897	0.340	100	0.2	LOS A	0.0	0.0	Full	1150	0.0	0.0
Lane 3	18	5.9	18	5.9	96	0.186	100	44.0	LOS E	0.5	3.5	Short	60	0.0	NA
Approach	1306	4.4	1306	4.4		0.340		0.8	NA	0.5	3.5				
West: Fir Street															
Lane 1	68	0.0	68	0.0	8	8.455	100	6870.8	LOS F	39.6	276.9	Full	260	0.0	6.9
Approach	68	0.0	68	0.0		8.455		6870.8	LOS F	39.6	276.9				
All Vehicles	3027	3.8	3027	3.8		8.455		156.1	NA	39.6	276.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: R44

Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	OV.
From S To Exit	W	N			veh/h	v/c	%	%	Lane No.
Lane 1	195	629	824	3.1	1889	0.436	100	NA	NA
Lane 2	-	829	829	3.9	1902	0.436	100	NA	NA
Approach	195	1458	1653	3.5		0.436			

North: R44

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	OV.
From N To Exit	S	W			veh/h	v/c	%	%	Lane No.
Lane 1	644	-	644	4.3	1897	0.340	100	NA	NA
Lane 2	644	-	644	4.3	1897	0.340	100	NA	NA
Lane 3	-	18	18	5.9	96	0.186	100	0.0	2

Approach 1288 18 1306 4.4 0.340

West: Fir Street

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From W To Exit:	N	S			veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	18	51	68	0.0	8	8.455	100	NA	NA
Approach	18	51	68	0.0	8.455				
Total %HV Deg Satn (v/c)									

All Vehicles 3027 3.8 8.455

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppng in Flow Rate % veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Fir Street				
Lane 1	0.0	30.2	13419.2	NA

LANE SUMMARY

Site: 101v [Int 8: R44 / Fir Street_PMPeak - Conversion (Site Folder: 2023 PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Site Category: (None)
 Signals - EQUISAT (Fixed-Time/SCATS) Isolated Delay
 Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h	HV] %	[Total veh/h	HV] %	veh/h	v/c	%	sec		[Veh	Dist] m		m	%	%
South: R44															
Lane 1	827	3.1	827	3.1	1524	0.543	100	4.5	LOS A	11.8	84.6	Full	490	0.0	0.0
Lane 2	826	3.9	826	3.9	1521	0.543	100	3.4	LOS A	12.6	91.3	Full	490	0.0	0.0
Approach	1653	3.5	1653	3.5		0.543		3.9	LOS A	12.6	91.3				
North: R44															
Lane 1	644	4.3	644	4.3	1517	0.425	100	2.9	LOS A	8.4	61.2	Full	1150	0.0	0.0
Lane 2	644	4.3	644	4.3	1517	0.425	100	2.9	LOS A	8.4	61.2	Full	1150	0.0	0.0
Lane 3	18	5.9	18	5.9	153	0.117	100	12.3	LOS B	0.3	2.3	Short	60	0.0	NA
Approach	1306	4.4	1306	4.4		0.425		3.0	LOS A	8.4	61.2				
West: Fir Street															
Lane 1	68	0.0	68	0.0	124	0.553	100	53.1	LOS D	3.2	22.1	Full	260	0.0	0.0
Approach	68	0.0	68	0.0		0.553		53.1	LOS D	3.2	22.1				
All Vehicles	3027	3.8	3027	3.8		0.553		4.6	LOS A	12.6	91.3				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)										
South: R44										
Mov.	L2	T1	Total	%HV		Deg.	Lane	Prob.	Ov.	
From S To Exit	W	N			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.	
Lane 1	195	632	827	3.1	1524	0.543	100	NA	NA	
Lane 2	-	826	826	3.9	1521	0.543	100	NA	NA	
Approach	195	1458	1653	3.5		0.543				
North: R44										
Mov.	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	
From N To Exit	S	W			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.	
Lane 1	644	-	644	4.3	1517	0.425	100	NA	NA	
Lane 2	644	-	644	4.3	1517	0.425	100	NA	NA	
Lane 3	-	18	18	5.9	153	0.117	100	0.0	2	
Approach	1288	18	1306	4.4		0.425				
West: Fir Street										

Mov. From W To Exit:	L2 N	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	18	51	68	0.0	124	0.553	100	NA	NA
Approach	18	51	68	0.0		0.553			
	Total	%HV/Deg.	Satn (v/c)						
All Vehicles	3027	3.8	0.553						

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

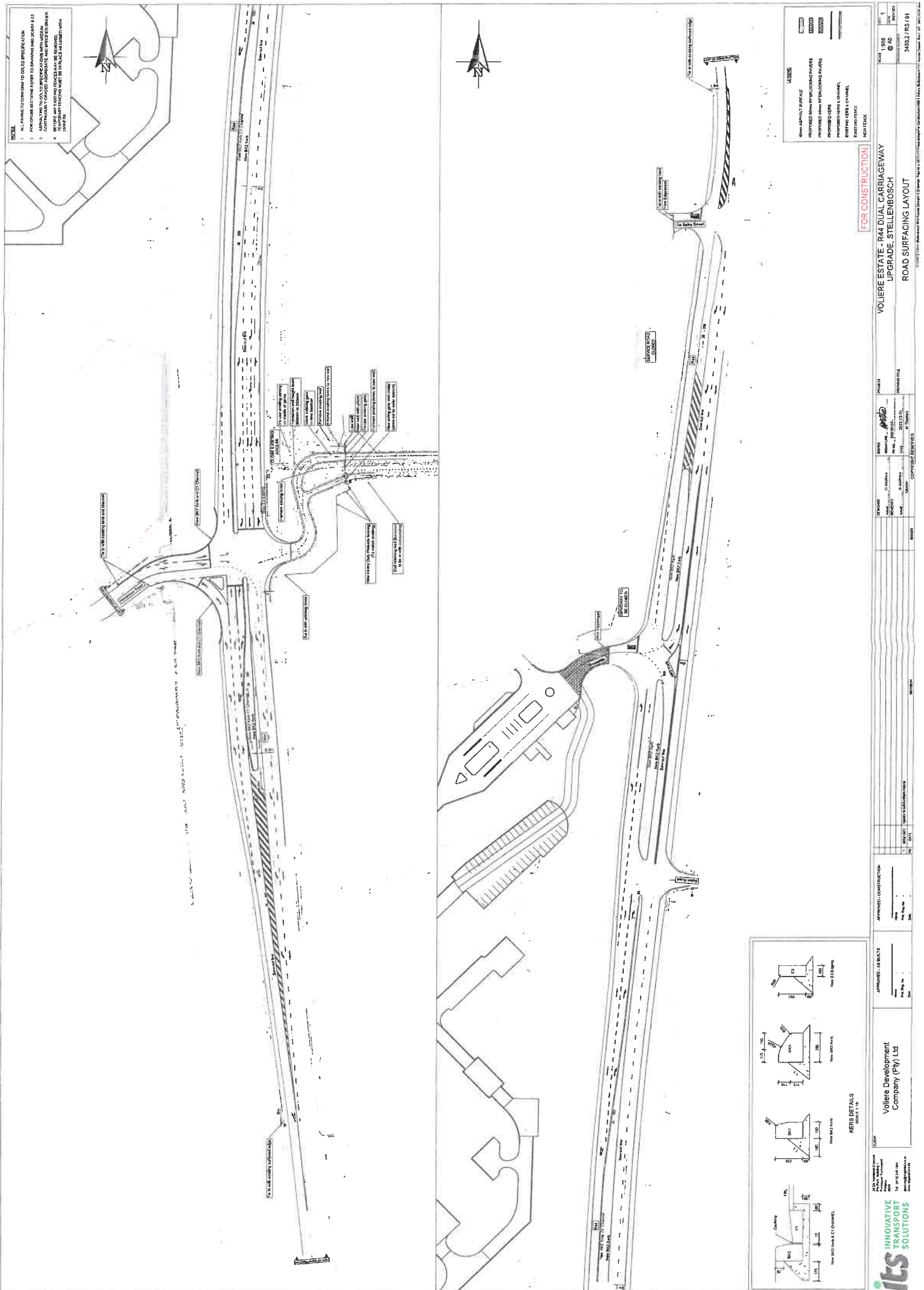
Merge Analysis											
Exit Lane Number	Short Lane Length m	Percent Oppng in Lane	Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis				
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Fir Street				
Lane 1	0.0	0.0	0.0	0.0

Appendix C

Current Upgrades to R44 / Hendrikse Road Intersection



Appendix D

SIDRA Analysis 2026 Background Traffic

LANE SUMMARY

 Site: Int1 [Int 1: R44 / Hendriske Road_AM

Peak_NextUpgraded - Esc Existing + Prev Devs (Site Folder:
2026 AM Peak - Esc Existing + Prev Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 30 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist] m		m	% %
South: R44														
Lane 1	100	0.0	100	0.0	1185	0.084	100	7.0	LOS A	0.3	2.3	Short	20	0.0 NA
Lane 2	192	1.3	192	1.3	580	0.330	35 ⁶	10.7	LOS B	2.3	16.4	Full	500	0.0 0.0
Lane 3	539	1.3	539	1.3	578	0.932	100	25.6	LOS C	12.6	89.3	Short	45	0.0 NA
Approach	831	1.1	831	1.1		0.932		19.9	LOS B	12.6	89.3			
East: RoadName														
Lane 1	2	0.0	2	0.0	481	0.004	100	13.7	LOS B	0.0	0.2	Full	500	0.0 0.0
Approach	2	0.0	2	0.0		0.004		13.7	LOS B	0.0	0.2			
North: R44														
Lane 1	682	1.0	682	1.0	581	1.173	100	177.7	LOS F	53.4	376.9	Full	500	0.0 0.0
Lane 2	436	1.0	436	1.0	581	0.750	64 ⁶	133.8	LOS F	6.9	48.4	Full	500	0.0 0.0
Lane 3	33	0.0	33	0.0	264	0.124	100	20.0	LOS C	0.5	3.3	Short	80	0.0 NA
Approach	1151	1.0	1151	1.0		1.173		156.6	LOS F	53.4	376.9			
West: Hendriske Road														
Lane 1	583	0.0	583	0.0	454 ¹	1.283	100	284.7	LOS F	61.5	430.6	Short	20	0.0 NA
Lane 2	405	0.0	405	0.0	469 ¹	0.862	67 ⁶	149.4	LOS F	7.8	54.7	Full	500	0.0 0.0
Approach	987	0.0	987	0.0		1.283		229.3	LOS F	61.5	430.6			
All Vehicles	2971	0.7	2971	0.7		1.283		142.4	LOS F	61.5	430.6			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

- ⁶ Lane under-utilisation due to downstream effects

Approach Lane Flows (veh/h)

South: R44

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit:	W	N	E			veh/h	v/c	%	%	
Lane 1	100	-	-	100	0.0	1185	0.084	100	0.0	2
Lane 2	-	192	-	192	1.3	580	0.330	35 ⁶	NA	NA
Lane 3	-	538	1	539	1.3	578	0.932	100	68.6	2

Approach 100 729 1 831 1.1 0.932

East: RoadName

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From E					veh/h	Satn	Util.	SL Ov.	Lane
To Exit	S	N				v/c	%	%	No.
Lane 1	1	1	2	0.0	481	0.004	100	NA	NA
Approach	1	1	2	0.0		0.004			

North: R44

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From N						veh/h	Satn	Util.	SL Ov.	Lane
To Exit	E	S	W				v/c	%	%	No.
Lane 1	1	681	-	682	1.0	581	1.173	100	NA	NA
Lane 2	-	436	-	436	1.0	581	0.750	64 ⁵	NA	NA
Lane 3	-	-	33	33	0.0	264	0.124	100	0.0	2
Approach	1	1117	33	1151	1.0		1.173			

West: Hendriske Road

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From W					veh/h	Satn	Util.	SL Ov.	Lane
To Exit	N	S				v/c	%	%	No.
Lane 1	51	532	583	0.0	454 ¹	1.283	100	100.0	2
Lane 2	-	405	405	0.0	469 ¹	0.862	67 ⁶	NA	NA
Approach	51	937	987	0.0		1.283			
Total	%HV Deg Satn (v/c)								

All Vehicles 2971 0.7 1.283

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.
- 6 Lane under-utilisation due to downstream effects

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppng In Lane	Flow Rate	Opposing Flow Rate	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate	Capacity	Deg. Satn	Min. Delay	Merge Delay
			veh/h	veh/h			veh/h	veh/h	v/c	sec	sec

South Exit: R44

Merge Type: Priority

Exit Short Lane	2	120	0.0	996	999	3.01	2.01	841	750	1.121	2.7	120.8
Merge Lane	1	-	100.0	Merge Lane is not Opposed				996	1800	0.553	0.0	0.0

North Exit: R44

Merge Type: Priority

Exit Short Lane	1	60	0.0	559	562	3.02	2.01	211	1209	0.175	1.0	1.4
Merge Lane	2	-	100.0	Merge Lane is not Opposed				559	1800	0.310	0.0	0.0

Variable Demand Analysis

Initial Queued Demand	Residual Queued Demand	Time for Residual Demand to Clear	Duration of Oversatn
veh	veh	sec	sec

South: R44

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

East: RoadName

Lane 1	0.0	0.0	0.0	0.0
North: R44				
Lane 1	0.0	50.4	312.2	NA
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Hendriske Road				
Lane 1	0.0	64.3	509.9	NA
Lane 2	0.0	0.0	0.0	0.0

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LANE SUMMARY

Site: Int1 [Int 1: R44 / Hendriske Road_AM Peak_Duel - Esc
Existing + Prev Devs (Site Folder: 2026 AM Peak - Esc Existing
+ Prev Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 50 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist] m		m	%	%
South: R44															
Lane 1	100	0.0	100	0.0	1443	0.069	100	6.4	LOS A	0.3	2.2	Short	80	0.0	NA
Lane 2	192	1.3	192	1.3	619	0.311	35 ⁶	15.6	LOS B	3.6	25.8	Full	500	0.0	0.0
Lane 3	538	1.3	538	1.3	615	0.876	100	26.5	LOS C	16.1	113.8	Full	500	0.0	0.0
Approach	831	1.1	831	1.1		0.876		21.6	LOS C	16.1	113.8				
East: RoadName															
Lane 1	2	0.0	2	0.0	679	0.003	100	13.9	LOS B	0.0	0.2	Full	500	0.0	0.0
Approach	2	0.0	2	0.0		0.003		13.9	LOS B	0.0	0.2				
North: R44															
Lane 1	559	1.0	559	1.0	620	0.902	100	29.7	LOS C	17.8	125.6	Full	500	0.0	0.0
Lane 2	559	1.0	559	1.0	620	0.902	100	29.6	LOS C	17.8	125.7	Full	500	0.0	0.0
Lane 3	33	0.0	33	0.0	156	0.209	100	31.9	LOS C	0.8	5.8	Short	80	0.0	NA
Approach	1151	1.0	1151	1.0		0.902		29.7	LOS C	17.8	125.7				
West: Hendriske Road															
Lane 1	494	0.0	494	0.0	446 ¹	1.108	100	150.3	LOS F	37.1	260.0	Short	20	0.0	NA
Lane 2	493	0.0	493	0.0	445 ¹	1.108	100	150.2	LOS F	37.1	259.4	Full	500	0.0	0.0
Approach	987	0.0	987	0.0		1.108		150.2	LOS F	37.1	260.0				
All Vehicles	2971	0.7	2971	0.7		1.108		67.5	LOS E	37.1	260.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

- ⁶ Lane under-utilisation due to downstream effects

Approach Lane Flows (veh/h)										
South: R44										
Mov.	L2	R1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit	W	N	E			veh/h	v/c	%	%	
Lane 1	100	-	-	100	0.0	1443	0.069	100	0.0	2
Lane 2	-	192	-	192	1.3	619	0.311	35 ⁶	NA	NA
Lane 3	-	537	1	538	1.3	615	0.876	100	NA	NA

Approach 100 729 1 831 1.1 0.876

East: RoadName

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From E To Exit:	S	N			veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	1	1	2	0.0	679	0.003	100	NA	NA
Approach	1	1	2	0.0		0.003			

North: R44

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From N To Exit:	E	S	W			veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	1	558	-	559	1.0	620	0.902	100	NA	NA
Lane 2	-	559	-	559	1.0	620	0.902	100	NA	NA
Lane 3	-	-	33	33	0.0	156	0.209	100	0.0	2
Approach	1	1117	33	1151	1.0		0.902			

West: Hendriske Road

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From W To Exit:	N	S			veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	51	444	494	0.0	446	1.108	100	100.0	2
Lane 2	-	493	493	0.0	445	1.108	100	NA	NA
Approach	51	937	987	0.0		1.108			

Total %HV/Deg.Satn (v/c)

All Vehicles 2971 0.7 1.108

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.
- Lane under-utilisation due to downstream effects

Merge Analysis

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Oppng in Lane %veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec		
North Exit: R44												
Merge Type: Priority												
Exit Short Lane	1	60	0.0	561	565	3.02	2.01	215	1206	0.178	1.0	1.4
Merge Lane	2	-	100.0	Merge Lane is not Opposed			561	1800	0.312	0.0	0.0	

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
East: RoadName				
Lane 1	0.0	0.0	0.0	0.0
North: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

Lane 3	0.0	0.0	0.0	0.0
West: Hendriske Road				
Lane 1	0.0	24.1	194.6	NA
Lane 2	0.0	24.1	194.6	NA

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LANE SUMMARY

Site: [Int 2: Hendriske Road / Tolbos Road_AM Peak - Esc Existing + Prev Devs (Site Folder: 2026 AM Peak - Esc Existing + Prev Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	% %
South: Hendriske Road														
Lane 1	198	0.0	198	0.0	647	0.306	100	13.7	LOS B	1.1	7.9	Full	500	0.0 0.0
Approach	198	0.0	198	0.0		0.306		13.7	LOS B	1.1	7.9			
East: Tolbos Road														
Lane 1	107	0.0	107	0.0	609	0.176	100	12.7	LOS B	0.6	4.1	Full	500	0.0 0.0
Approach	107	0.0	107	0.0		0.176		12.7	LOS B	0.6	4.1			
North: Hendriske Road														
Lane 1	125	0.8	125	0.8	525	0.239	100	14.8	LOS B	0.9	6.0	Full	500	0.0 0.0
Approach	125	0.8	125	0.8		0.239		14.8	LOS B	0.9	6.0			
West: Tolbos Road														
Lane 1	14	0.0	14	0.0	104	0.131	100	45.4	LOS E	0.5	3.3	Full	500	0.0 0.0
Approach	14	0.0	14	0.0		0.131		45.4	LOS E	0.5	3.3			
All Vehicles	444	0.2	444	0.2		0.306		14.7	LOS B	1.1	7.9			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab). Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)											
South: Hendriske Road											
Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From S To Exit:	W	N	E			Cap. veh/h	v/c	%	%		
Lane 1	5	191	2	198	0.0	647	0.306	100	NA	NA	
Approach	5	191	2	198	0.0		0.306				
East: Tolbos Road											
Mov.	L2	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.		
From E To Exit:	S	N			Cap. veh/h	v/c	%	%			
Lane 1	13	95	107	0.0	609	0.176	100	NA	NA		
Approach	13	95	107	0.0		0.176					
North: Hendriske Road											
Mov.	L2	T1	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.		
From N To Exit:	E	S			Cap. veh/h	v/c	%	%			

Lane 1	46	79	125	0.8	525	0.239	100	NA	NA
Approach	46	79	125	0.8	0.239				

West: Tolbos Road

Mov.	L2	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Qv. Lane No.
From W/ To Exit:	N								
Lane 1	14	14	0.0		104	0.131	100	NA	NA
Approach	14	14	0.0		0.131				

	Total	%HV	Deg. Satn (v/c)	
All Vehicles	444	0.2	0.306	

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppg in Lane	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0
East: Tolbos Road				
Lane 1	0.0	0.0	0.0	0.0
North: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0
West: Tolbos Road				
Lane 1	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: [Int 3: Hendriske Road / Williams Road_AM Peak - Esc Existing + Prev Devs (Site Folder: 2026 AM Peak - Esc Existing + Prev Devs)]

Output produced by **SIDRA INTERSECTION Version: 9.1.6.228**

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist] m		m	% %
South: Williams Road														
Lane 1	58	1.8	58	1.8	426	0.136	100	15.4	LOS C	0.5	3.2	Full	500	0.0 0.0
Approach	58	1.8	58	1.8		0.136		15.4	LOS C	0.5	3.2			
East: Hendriske Road														
Lane 1	92	1.1	92	1.1	510	0.180	100	14.4	LOS B	0.6	4.3	Full	500	0.0 0.0
Approach	92	1.1	92	1.1		0.180		14.4	LOS B	0.6	4.3			
West: RoadName														
Lane 1	152	0.0	152	0.0	653	0.232	100	12.8	LOS B	0.8	5.6	Full	500	0.0 0.0
Approach	152	0.0	152	0.0		0.232		12.8	LOS B	0.8	5.6			
All Vehicles	301	0.7	301	0.7		0.232		13.8	LOS B	0.8	5.6			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)										
South: Williams Road										
Mov.	L2	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From S To Exit:	W	E			Cap. veh/h	v/c	%	%		
Lane 1	6	52	58	1.8	426	0.136	100	NA	NA	
Approach	6	52	58	1.8		0.136				
East: Hendriske Road										
Mov.	L2	T1	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From E To Exit:	S	W			Cap. veh/h	v/c	%	%		
Lane 1	34	58	92	1.1	510	0.180	100	NA	NA	
Approach	34	58	92	1.1		0.180				
West: RoadName										
Mov.	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From W To Exit:	E	S			Cap. veh/h	v/c	%	%		
Lane 1	147	4	152	0.0	653	0.232	100	NA	NA	
Approach	147	4	152	0.0		0.232				

Role	Flow	Flow	Flow
All Vehicles	301	0.7	0.232

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis										
Exit Lane Number	Short Lane Length	Percent Oppng In Lane	Flow Rate	Critical Gap	Follow-up Headway	Lane Capacity	Deg. Satn	Min. Delay	Merge Delay	
	m	% veh/h	pcu/h	sec	sec	veh/h	veh/h	sec	sec	sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis				
	Initial Queued Demand	Residual Queued Demand	Time for Residual Demand to Clear	Duration of Oversatn
	veh	veh	sec	sec
South: Williams Road				
Lane 1	0.0	0.0	0.0	0.0
East: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0
West: RoadName				
Lane 1	0.0	0.0	0.0	0.0

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LANE SUMMARY

▽ Site: 101 [Int 4: Hendriske Road / Rhode Road_AM Peak - Esc Existing + Prev Devs (Site Folder: 2026 AM Peak - Esc Existing + Prev Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Give-Way (Two-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.	
	[Total HV]		[Total HV]							[Veh	Dist]			%	%
	veh/h	%	veh/h	%						veh/h	v/c			%	sec
South: Rhode Road															
Lane 1	22	0.0	22	0.0	1255	0.018	100	5.9	LOS A	0.1	0.4	Full	500	0.0	0.0
Approach	22	0.0	22	0.0		0.018		5.9	LOS A	0.1	0.4				
East: Hendriske Road															
Lane 1	63	0.0	63	0.0	1920	0.033	100	1.8	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	63	0.0	63	0.0		0.033		1.8	NA	0.0	0.0				
West: Hendriske Road															
Lane 1	142	0.0	142	0.0	1942	0.073	100	0.1	LOS A	0.0	0.1	Full	500	0.0	0.0
Approach	142	0.0	142	0.0		0.073		0.1	NA	0.0	0.1				
All Vehicles	227	0.0	227	0.0		0.073		1.1	NA	0.1	0.4				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)										
South: Rhode Road										
Mov.	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
From S To Exit:	W	E								
Lane 1	9	13	22	0.0	1255	0.018	100	NA	NA	
Approach	9	13	22	0.0		0.018				
East: Hendriske Road										
Mov.	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
From E To Exit:	S	W								
Lane 1	20	43	63	0.0	1920	0.033	100	NA	NA	
Approach	20	43	63	0.0		0.033				
West: Hendriske Road										
Mov.	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
From W To Exit:	E	S								

Lane 1	139	3	142	0.0	1942	0.073	100	NA	NA
Approach	139	3	142	0.0		0.073			

Total %HMD Satn (v/c)

All Vehicles 227 0.0 0.073

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane	Percent Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Capacity Flow Rate	Deg. Satn	Min. Delay	Merge Delay
		% veh/h per/h	sec	sec	veh/h	w/c	sec	sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial Queued Demand	Residual Queued Demand	Time for Residual Demand to Clear	Duration of Oversatn
veh	veh	sec	sec

South: Rhode Road

Lane 1 0.0 0.0 0.0 0.0

East: Hendriske Road

Lane 1 0.0 0.0 0.0 0.0

West: Hendriske Road

Lane 1 0.0 0.0 0.0 0.0

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LANE SUMMARY

 Site: [Int 5: Lang Road / Gabriels Road_AM Peak - Esc
Existing + Prev Devs (Site Folder: 2026 AM Peak - Esc Existing
+ Prev Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	HV %	[Total veh/h]	HV %	veh/h	v/c	%	sec		[Veh]	[Dist] m		m	%	%
South: Lang Road															
Lane 1	337	0.0	337	0.0	1028	0.328	100	10.9	LOS B	1.1	7.9	Full	500	0.0	0.0
Approach	337	0.0	337	0.0		0.328		10.9	LOS B	1.1	7.9				
East: Gabriels Road															
Lane 1	43	0.0	43	0.0	235	0.184	100	24.6	LOS C	0.7	4.7	Full	500	0.0	0.0
Approach	43	0.0	43	0.0		0.184		24.6	LOS C	0.7	4.7				
North: Lang Road															
Lane 1	839	0.5	839	0.5	1140	0.736	100	17.3	LOS C	5.4	37.8	Full	500	0.0	0.0
Approach	839	0.5	839	0.5		0.736		17.3	LOS C	5.4	37.8				
All Vehicles	1219	0.3	1219	0.3		0.736		15.7	LOS C	5.4	37.8				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Lang Road

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit:	N	E			veh/h	v/c	%	%	
Lane 1	328	8	337	0.0	1028	0.328	100	NA	NA
Approach	328	8	337	0.0		0.328			

East: Gabriels Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit:	S	N			veh/h	v/c	%	%	
Lane 1	34	9	43	0.0	235	0.184	100	NA	NA
Approach	34	9	43	0.0		0.184			

North: Lang Road

Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From N To Exit:	E	S			veh/h	v/c	%	%	
Lane 1	7	832	839	0.5	1140	0.736	100	NA	NA
Approach	7	832	839	0.5		0.736			

	Total	%H/W	Design (V/C)
All Vehicles	1219	0.3	0.736

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis										
Exit Lane Number	Short Lane Length m	Percent Oppg in Lane	Opposing Flow Rate %veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Capacity veh/h	Deg. Satn V/C	Min. Delay sec	Merge Delay sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis				
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec

South: Lang Road

Lane 1	0.0	0.0	0.0	0.0
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East: Gabriels Road

Lane 1	0.0	0.0	0.0	0.0
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North: Lang Road

Lane 1	0.0	0.0	0.0	0.0
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LANE SUMMARY

 **Site:** [Int 6: Welgevonden Blvd / Lang Road_AM Peak - Esc Existing + Prev Devs (Site Folder: 2026 AM Peak - Esc Existing + Prev Devs)]

Output produced by **SIDRA INTERSECTION Version: 9.1.6.228**

New Site

Site Category: (None)

Stop (Two-Way)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Sain	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total]	HV]	[Total]	HV]	veh/h	v/c	%	sec		[Veh]	Dist]		m	%	%
	veh/h	%	veh/h	%							m				
South: Lang Road															
Lane 1	209	1.0	209	1.0	1169	0.179	100	8.9	LOS A	0.8	5.4	Full	500	0.0	0.0
Approach	209	1.0	209	1.0		0.179		8.9	LOS A	0.8	5.4				
East: Welgevonden Blvd															
Lane 1	121	0.0	121	0.0	1938	0.062	100	0.7	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	121	0.0	121	0.0		0.062		0.7	NA	0.0	0.0				
West: Welgevonden Blvd															
Lane 1	663	1.1	663	1.1	1622	0.409	100	5.7	LOS A	2.6	18.7	Full	500	0.0	0.0
Approach	663	1.1	663	1.1		0.409		5.7	NA	2.6	18.7				
All Vehicles	994	1.0	994	1.0		0.409		5.8	NA	2.6	18.7				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Lang Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Sain	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit	W	E			veh/h	v/c	%	%	
Lane 1	202	7	209	1.0	1169	0.179	100	NA	NA
Approach	202	7	209	1.0		0.179			

East: Welgevonden Blvd

Mov.	L2	T1	Total	%HV	Cap.	Deg. Sain	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit	S	W			veh/h	v/c	%	%	
Lane 1	15	106	121	0.0	1938	0.062	100	NA	NA
Approach	15	106	121	0.0		0.062			

West: Welgevonden Blvd

Mov.	T1	R2	Total	%HV	Cap.	Deg. Sain	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From W To Exit	E	S			veh/h	v/c	%	%	

Lane 1	42	621	663	1.1	1622	0.409	100	NA	NA
Approach	42	621	663	1.1		0.409			

Total %HV/D Sat (V/C)

All Vehicles 994 1.0 0.409

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppng in Flow Rate %veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Sain v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
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South: Lang Road

Lane 1 0.0 0.0 0.0 0.0

East: Welgevonden Blvd

Lane 1 0.0 0.0 0.0 0.0

West: Welgevonden Blvd

Lane 1 0.0 0.0 0.0 0.0

LANE SUMMARY

Site: Int7 [Int 7: R304 / Welgevonden Blvd_AM Peak - Esc Existing + Prev Devs (Site Folder: 2026 AM Peak - Esc Existing + Prev Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 110 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Sain	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	% %
South: R304														
Lane 1	1206	1.5	1206	1.5	1111 ¹	1.085	100	135.1	LOS F	115.9	821.3	Full	500	0.0 50.6
Lane 2	251	0.0	251	0.0	173	1.446	100	451.4	LOS F	37.9	265.1	Short	70	0.0 NA
Approach	1457	1.2	1457	1.2		1.446		189.5	LOS F	115.9	821.3			
East: Welgevonden Blvd														
Lane 1	178	0.0	178	0.0	422	0.421	100	53.2	LOS D	8.2	57.7	Short	45	0.0 NA
Lane 2	248	0.0	248	0.0	216 ¹	1.152	100	217.3	LOS F	27.0	189.1	Full	500	0.0 0.0
Approach	426	0.0	426	0.0		1.152		148.8	LOS F	27.0	189.1			
North: R304														
Lane 1	339	0.6	339	0.6	1227	0.276	100	26.0	LOS C	7.3	51.7	Short	100	0.0 NA
Lane 2	1313	2.3	1313	2.3	1102 ¹	1.191	100	220.4	LOS F	156.7	1119.1	Full	500	0.0 80.3
Approach	1652	2.0	1652	2.0		1.191		180.5	LOS F	156.7	1119.1			
All Vehicles	3535	1.4	3535	1.4		1.446		180.4	LOS F	156.7	1119.1			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)

South: R304

Mov.	T1	R2	Total	%HV	Cap.	Deg. Sain	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit:	N	E			veh/h	v/c	%	%	
Lane 1	1206	-	1206	1.5	1111 ¹	1.085	100	NA	NA
Lane 2	-	251	251	0.0	173	1.446	100	100.0	1
Approach	1206	251	1457	1.2		1.446			

East: Welgevonden Blvd

Mov.	L2	R2	Total	%HV	Cap.	Deg. Sain	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit:	S	N			veh/h	v/c	%	%	
Lane 1	178	-	178	0.0	422	0.421	100	27.7	2
Lane 2	-	248	248	0.0	216 ¹	1.152	100	NA	NA

Approach 178 248 426 0.0 1.152

North: R304

Mov.	L2	T1	Total	%HV	Cap.	Deq.	Lane	Prob.	Op.
From N					veh/h	sat	Util.	SL	Lane
To Exit	E	S				v/c	%	%	No.
Lane 1	339	-	339	0.6	1227	0.276	100	0.0	2
Lane 2	-	1313	1313	2.3	1102 ¹	1.191	100	NA	NA
Approach	339	1313	1652	2.0		1.191			
Total %HV/Deq./Sat/v/c									
All Vehicles	3535	1.4		1.446					

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

Exit	Short	Percent	Opposing	Critical	Follow-up	Lane Capacity	Deq.	Min.	Merge
Lane	Lane	Oppg In	Flow Rate	Gap	Headway	Flow	Sat	Delay	Delay
Number	Length	Lane	%veh/h pcu/h	sec	sec	veh/h	v/c	sec	sec
	m								

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial	Residual	Time for	Duration
	Queued	Queued	Residual	of
	Demand	Demand	Demand	Oversat
	veh	veh	to Clear	sec
			sec	
South: R304				
Lane 1	0.0	47.4	153.6	NA
Lane 2	0.0	38.6	802.1	NA
East: Welgevonden Blvd				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	16.4	273.2	NA
North: R304				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	105.3	343.8	NA

LANE SUMMARY

Site: Int7 [Int 7: R304 / Welgevonden Blvd_AM Peak - Esc Existing + Prev Devs_Miti (Site Folder: 2026 AM Peak - Esc Existing + Prev Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist] m		m	%	%
South: R304															
Lane 1	617	1.5	617	1.5	901	0.685	100	25.6	LOS C	21.2	150.4	Full	500	0.0	0.0
Lane 2	589	1.5	589	1.5	860 ¹	0.685	100	22.8	LOS C	20.2	143.5	Short	200	0.0	NA
Lane 3	251	0.0	251	0.0	362	0.692	100	29.8	LOS C	7.0	48.8	Short	70	0.0	NA
Approach	1457	1.2	1457	1.2		0.692		25.2	LOS C	21.2	150.4				
East: Welgevonden Blvd															
Lane 1	178	0.0	178	0.0	743	0.239	100	24.8	LOS C	5.2	36.2	Short	45	0.0	NA
Lane 2	248	0.0	248	0.0	371	0.669	100	42.9	LOS D	10.5	73.4	Full	500	0.0	0.0
Approach	426	0.0	426	0.0		0.669		35.3	LOS D	10.5	73.4				
North: R304															
Lane 1	339	0.6	339	0.6	863	0.393	100	22.4	LOS C	9.7	68.2	Short	100	0.0	NA
Lane 2	656	2.3	656	2.3	896	0.732	100	20.9	LOS C	23.3	166.6	Short	200	0.0	NA
Lane 3	656	2.3	656	2.3	896	0.732	100	26.9	LOS C	23.3	166.6	Full	500	0.0	0.0
Approach	1652	2.0	1652	2.0		0.732		23.6	LOS C	23.3	166.6				
All Vehicles	3535	1.4	3535	1.4		0.732		25.7	LOS C	23.3	166.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)

South: R304

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit	N	E			veh/h	v/c	%	%	
Lane 1	617	-	617	1.5	901	0.685	100	NA	NA
Lane 2	589	-	589	1.5	860 ¹	0.685	100	0.0	1
Lane 3	-	251	251	0.0	362	0.692	100	0.0	2
Approach	1206	251	1457	1.2		0.692			

East: Welgevonden Blvd

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit	S	N			veh/h	v/c	%	%	

Lane 1	178	-	178	0.0	743	0.239	100	0.0	2
Lane 2	-	248	248	0.0	371	0.669	100	NA	NA
Approach	178	248	426	0.0	0.669				

North: R304

Mov.	L2	T1	Total	%HV	Cap.	Deg.	Lane	Prob.	Qv.
From N					veh/h	Satn	Util.	SL Ov.	Lane
To Exit:	E	S				v/c	%	%	No.
Lane 1	339	-	339	0.6	863	0.393	100	0.0	2
Lane 2	-	656	656	2.3	896	0.732	100	0.0	3
Lane 3	-	656	656	2.3	896	0.732	100	NA	NA
Approach	339	1313	1652	2.0	0.732				
Total %HV/Deg. Satn (v/c)									

All Vehicles 3535 1.4 0.732

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

Exit	Short	Percent	Opposing	Critical	Follow-up	Lane Capacity	Deg.	Min.	Merge
Lane	Lane	Oppg In	Flow Rate	Gap	Headway	Flow	Satn	Delay	Delay
Number	Length	Lane	% veh/h	sec	sec	veh/h	v/c	sec	sec
	m		% veh/h	pcu/h					

South Exit: R304

Merge Type: Priority

Exit Short Lane	2	200	0.0	834	842	3.03	2.02	656	897	0.731	1.9	6.0
Merge Lane	1	-	100.0	Merge Lane is not Opposed				834	1800	0.463	0.0	0.0

North Exit: R304

Merge Type: Priority

Exit Short Lane	1	200	0.0	838	842	3.02	2.01	617	907	0.681	1.9	5.3
Merge Lane	2	-	100.0	Merge Lane is not Opposed				838	1800	0.465	0.0	0.0

Variable Demand Analysis

Initial	Residual	Time for	Duration
Queued	Queued	Residual	of
Demand	Demand	Demand	Oversatn
		to Clear	
veh	veh	sec	sec

South: R304

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

East: Welgevonden Blvd

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

North: R304

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [Int 8: R44 / Fir Street_AMPeak - Esc Existing + Prev Devs - Conversion (Site Folder: 2026 AM Peak - Esc Existing + Prev Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
South: R44															
Lane 1	598	3.6	598	3.6	1391	0.430	100	7.1	LOS A	13.3	96.3	Full	490	0.0	0.0
Lane 2	600	4.0	600	4.0	1394	0.430	100	6.6	LOS A	13.4	96.8	Full	490	0.0	0.0
Approach	1198	3.8	1198	3.8		0.430		6.8	LOS A	13.4	96.8				
North: R44															
Lane 1	1212	2.1	1212	2.1	1411	0.859	100	12.2	LOS B	50.2	357.5	Full	1150	0.0	0.0
Lane 2	1027	2.1	1027	2.1	1196 ¹	0.859	100	21.1	LOS C	44.5	317.3	Full	1150	0.0	0.0
Lane 3	58	0.0	58	0.0	243	0.238	100	23.7	LOS C	1.6	11.1	Short	60	0.0	NA
Approach	2297	2.1	2297	2.1		0.859		16.5	LOS B	50.2	357.5				
West: Fir Street															
Lane 1	265	0.8	265	0.8	308	0.862	100	67.1	LOS E	17.0	119.6	Full	260	0.0	0.0
Approach	265	0.8	265	0.8		0.862		67.1	LOS E	17.0	119.6				
All Vehicles	3760	2.5	3760	2.5		0.862		17.0	LOS B	50.2	357.5				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)										
South: R44										
Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From S To Exit	W	N			veh/h	v/c	%	%		
Lane 1	56	542	598	3.6	1391	0.430	100	NA	NA	
Lane 2	-	600	600	4.0	1394	0.430	100	NA	NA	
Approach	56	1142	1198	3.8		0.430				
North: R44										
Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From N To Exit	S	W			veh/h	v/c	%	%		
Lane 1	1212	-	1212	2.1	1411	0.859	100	NA	NA	
Lane 2	1027	-	1027	2.1	1196 ¹	0.859	100	NA	NA	
Lane 3	-	58	58	0.0	243	0.238	100	0.0	2	

Approach 2239 58 2297 2.1 0.859

West: Fir Street

Mov.	L2	R2	Total	%HV	Gap	Deg.	Lane	Prob.	Ov.
From W					veh/h	Satn	Util.	SL Ov.	Lane
To Exit	N	S				v/c	%	%	No.
Lane 1	21	244	265	0.8	308	0.862	100	NA	NA
Approach	21	244	265	0.8		0.862			
	Total	%HV	Deg.	Satn	v/c				

All Vehicles 3760 2.5 0.862

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Opposing in Lane	Opposing Flow Rate %veh/h per/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Fir Street				
Lane 1	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: Int1 [Int 1: R44 / Hendriske Road_PM
Peak_NextUpgraded - Esc Existing + Prev Devs (Site Folder:
2026 PM Peak - Esc Existing + Prev Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 50 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
South: R44															
Lane 1	402	0.0	402	0.0	1199	0.335	100	7.6	LOS A	2.6	18.2	Short	80	0.0	NA
Lane 2	276	3.7	276	3.7	1181	0.234	35 ⁶	7.8	LOS A	3.0	21.7	Full	500	0.0	0.0
Lane 3	756	3.7	756	3.7	1146 ¹	0.660	100	7.0	LOS A	12.0	86.8	Short	45	0.0	NA
Approach	1435	2.6	1435	2.6		0.660		7.3	LOS A	12.0	86.8				
East: RoadName															
Lane 1	2	0.0	2	0.0	223	0.009	100	26.2	LOS C	0.0	0.3	Full	500	0.0	0.0
Approach	2	0.0	2	0.0		0.009		26.2	LOS C	0.0	0.3				
North: R44															
Lane 1	351	3.1	351	3.1	1185	0.296	100	4.8	LOS A	4.0	28.8	Full	500	0.0	0.0
Lane 2	225	3.1	225	3.1	1185	0.190	64 ⁶	5.5	LOS A	2.4	17.0	Full	500	0.0	0.0
Lane 3	93	0.0	93	0.0	266	0.348	100	19.2	LOS B	1.8	12.6	Short	80	0.0	NA
Approach	668	2.7	668	2.7		0.348		7.1	LOS A	4.0	28.8				
West: Hendriske Road															
Lane 1	151	0.6	151	0.6	244	0.619	100	30.3	LOS C	3.8	27.0	Short	20	0.0	NA
Lane 2	111	1.0	111	1.0	267	0.416	67 ⁶	29.4	LOS C	2.7	18.8	Full	500	0.0	0.0
Approach	262	0.8	262	0.8		0.619		29.9	LOS C	3.8	27.0				
All Vehicles	2367	2.4	2367	2.4		0.660		9.8	LOS A	12.0	86.8				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
 Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

- ⁶ Lane under-utilisation due to downstream effects

Approach Lane Flows (veh/h)

South: R44

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit	W	N	E			veh/h	v/c	%	%	
Lane 1	402	-	-	402	0.0	1199	0.335	100	0.0	2
Lane 2	-	276	-	276	3.7	1181	0.234	35 ⁶	NA	NA
Lane 3	-	755	1	756	3.7	1146 ¹	0.660	100	65.8	2

Approach 402 1032 1 1435 2.6 0.660

East: RoadName

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From E					veh/h	Satn	Util.	SL Ov.	Lane
To Exit	S	N				v/c	%	%	No.
Lane 1	1	1	2	0.0	223	0.009	100	NA	NA
Approach	1	1	2	0.0		0.009			

North: R44

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From N						veh/h	Satn	Util.	SL Ov.	Lane
To Exit	E	S	W				v/c	%	%	No.
Lane 1	1	350	-	351	3.1	1185	0.296	100	NA	NA
Lane 2	-	225	-	225	3.1	1185	0.190	64 ⁶	NA	NA
Lane 3	-	-	93	93	0.0	266	0.348	100	0.0	2
Approach	1	575	93	668	2.7		0.348			

West: Hendriske Road

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From W					veh/h	Satn	Util.	SL Ov.	Lane
To Exit	N	S				v/c	%	%	No.
Lane 1	56	95	151	0.6	244	0.619	100	32.4	2
Lane 2	-	111	111	1.0	267	0.416	67 ⁶	NA	NA
Approach	56	206	262	0.8		0.619			
Total									

All Vehicles 2367 2.4 0.660

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.
- 6 Lane under-utilisation due to downstream effects

Merge Analysis

	Exit Lane Number	Short Lane Length m	Percent Opp in Lane % veh/h	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: R44												
Merge Type: Priority												
Exit Short Lane	2	120	0.0	446	452	3.04	2.02	336	1312	0.256	0.8	1.1
Merge Lane	1	-	100.0	Merge Lane is not Opposed			446	1800	0.248	0.0	0.0	
North Exit: R44												
Merge Type: Priority												
Exit Short Lane	1	60	0.0	784	798	3.05	2.03	304	933	0.326	1.8	2.9
Merge Lane	2	-	100.0	Merge Lane is not Opposed			784	1800	0.436	0.0	0.0	

Variable Demand Analysis

Initial	Residual	Time for	Duration
Queued	Queued	Residual	of
Demand	Demand	Demand	Oversatn
veh	veh	to Clear	sec
		sec	

South: R44

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

East: RoadName

Lane 1	0.0	0.0	0.0	0.0
North: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

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LANE SUMMARY

Site: Int1 [Int 1: R44 / Hendriske Road_PM Peak_Duel- Esc Existing + Prev Devs (Site Folder: 2026 PM Peak - Esc Existing + Prev Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Delay Cycle Time = 50 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total Veh/h]	[HV] %	[Total veh/h]	[HV] %	veh/h	v/c	%	sec		[Veh]	[Dist] m		m	%	%
South: R44															
Lane 1	402	0.0	402	0.0	1183	0.340	100	7.6	LOS A	2.6	18.3	Short	80	0.0	NA
Lane 2	271	3.7	271	3.7	1219	0.222	35 ⁶	7.0	LOS A	2.8	20.1	Full	500	0.0	0.0
Lane 3	762	3.7	762	3.7	1217	0.626	100	5.9	LOS A	11.3	81.6	Full	500	0.0	0.0
Approach	1435	2.6	1435	2.6		0.626		6.6	LOS A	11.3	81.6				
East: RoadName															
Lane 1	2	0.0	2	0.0	192	0.011	100	27.4	LOS C	0.0	0.3	Full	500	0.0	0.0
Approach	2	0.0	2	0.0		0.011		27.4	LOS C	0.0	0.3				
North: R44															
Lane 1	288	3.1	288	3.1	1223	0.235	100	4.1	LOS A	3.0	21.5	Full	500	0.0	0.0
Lane 2	288	3.1	288	3.1	1223	0.235	100	4.1	LOS A	3.0	21.5	Full	500	0.0	0.0
Lane 3	93	0.0	93	0.0	281	0.330	100	17.6	LOS B	1.7	11.8	Short	80	0.0	NA
Approach	668	2.7	668	2.7		0.330		6.0	LOS A	3.0	21.5				
West: Hendriske Road															
Lane 1	122	0.6	122	0.6	210	0.583	100	31.1	LOS C	3.1	22.0	Short	20	0.0	NA
Lane 2	140	1.0	140	1.0	240	0.583	100	30.2	LOS C	3.5	24.9	Full	500	0.0	0.0
Approach	262	0.8	262	0.8		0.583		30.6	LOS C	3.5	24.9				
All Vehicles	2367	2.4	2367	2.4		0.626		9.1	LOS A	11.3	81.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDBA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDBA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects

Approach Lane Flows (veh/h)										
South: R44										
Mov.	L2	T1	R2	Total	%HV		Disc. Spill	Lane Util.	Prob. SLOV	Qv. Lane No.
From S To Exit	W	N	E			Cap. veh/h	%	%	%	
Lane 1	402	-	-	402	0.0	1183	0.340	100	0.0	2
Lane 2	-	271	-	271	3.7	1219	0.222	35 ⁵	NA	NA
Lane 3	-	761	1	762	3.7	1217	0.626	100	NA	NA
Approach	402	1032	1	1435	2.6		0.626			
East: RoadName										

Mov.	L2	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From E					Cap.	Satn	Util.	SL Ov.	Lane
To Exit:	S	N			veh/h	v/c	%	%	No.
Lane 1	1	1	2	0.0	192	0.011	100	NA	NA
Approach	1	1	2	0.0		0.011			
North: R44									
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.
From N						Cap.	Satn	Util.	SL Ov.
To Exit:	E	S	W			veh/h	v/c	%	%
Lane 1	1	287	-	288	3.1	1223	0.235	100	NA
Lane 2	-	288	-	288	3.1	1223	0.235	100	NA
Lane 3	-	-	93	93	0.0	281	0.330	100	0.0
Approach	1	575	93	668	2.7		0.330		
West: Hendriske Road									
Mov.	L2	R2	Total	%HV		Deg.	Lane	Prob.	Ov.
From W					Cap.	Satn	Util.	SL Ov.	Lane
To Exit:	N	S			veh/h	v/c	%	%	No.
Lane 1	56	67	122	0.6	210	0.583	100	13.7	2
Lane 2	-	140	140	1.0	240	0.583	100	NA	NA
Approach	56	206	262	0.8		0.583			
Total %HV Deg Satn (v/c)									
All Vehicles	2367	2.4		0.626					

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects

Merge Analysis												
Exit Lane Number	Short Lane Length	Percent Opng in Lane	Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Flow Rate	Capacity	Deg. Satn	Min. Delay	Merge Delay		
	m	%	veh/h	pcu/h	sec	sec	veh/h	veh/h	v/c	sec	sec	
North Exit: R44												
Merge Type: Priority												
Exit Short Lane	1	60	0.0	790	804	3.05	2.03	299	927	0.322	1.8	2.9
Merge Lane	2	-	100.0	Merge Lane is not Opposed			790	1800	0.439	0.0	0.0	

Variable Demand Analysis				
	Initial	Residual	Time for	Duration
	Queued	Queued	Residual	of
	Demand	Demand	Demand	Oversatn
	veh	veh	to Clear	sec
			sec	
South: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
East: RoadName				
Lane 1	0.0	0.0	0.0	0.0
North: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0

Lane 2	0.0	0.0	0.0	0.0
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To Exit	E	S	W			veh/h	v/c	%	%	No.
Lane 1	81	166	3	251	0.0	597	0.419	100	NA	NA
Approach	81	166	3	251	0.0		0.419			
West: Tolbos Road										
Mov.	L2	Total	%HV							
From W To Exit	N					Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Qv. Lane No.
Lane 1	1	1	0.0			1	1.000 ⁴	100	NA	NA
Approach	1	1	0.0				1.000			
Total										
All Vehicles										
	403	0.3				1.000				

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

⁴ x = 1.00 due to minimum capacity

Merge Analysis										
Exit Lane Number	Short Lane Length m	Percent Oppng in Lane	Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.										

Variable Demand Analysis				
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0
East: Tolbos Road				
Lane 1	0.0	0.0	0.0	0.0
North: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0
West: Tolbos Road				
Lane 1	0.0	0.0	0.0	NA

LANE SUMMARY

Site: [Int 3: Hendriske Road / Williams Road_PM Peak - Esc Existing + Prev Devs (Site Folder: 2026 PM Peak - Esc Existing + Prev Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist] m		m	% %
South: Williams Road														
Lane 1	34	0.0	34	0.0	370	0.091	100	16.2	LOS C	0.3	2.1	Full	500	0.0 0.0
Approach	34	0.0	34	0.0		0.091		16.2	LOS C	0.3	2.1			
East: Hendriske Road														
Lane 1	167	0.0	167	0.0	646	0.259	100	13.3	LOS B	0.9	6.4	Full	500	0.0 0.0
Approach	167	0.0	167	0.0		0.259		13.3	LOS B	0.9	6.4			
West: RoadName														
Lane 1	76	2.8	76	2.8	620	0.122	100	12.4	LOS B	0.4	2.8	Full	500	0.0 0.0
Approach	76	2.8	76	2.8		0.122		12.4	LOS B	0.4	2.8			
All Vehicles	277	0.8	277	0.8		0.259		13.4	LOS B	0.9	6.4			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Williams Road

Mov.	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From S To Exit	W	E							
Lane 1	4	29	34	0.0	370	0.091	100	NA	NA
Approach	4	29	34	0.0		0.091			

East: Hendriske Road

Mov.	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From E To Exit	S	W							
Lane 1	46	121	167	0.0	646	0.259	100	NA	NA
Approach	46	121	167	0.0		0.259			

West: RoadName

Mov.	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From W To Exit	E	S							
Lane 1	69	6	76	2.8	620	0.122	100	NA	NA
Approach	69	6	76	2.8		0.122			

Relat	%HV/D	Delay (s)	Relat	%HV/D	Delay (s)
All Vehicles	277	0.8			0.259

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis										
Exit Lane Number	Short Lane Length (m)	Percent Opposing Flow Rate	Opposing Flow Rate (veh/h)	Critical Gap (sec)	Follow-up Headway (sec)	Lane Capacity Flow Rate (veh/h)	Lane Capacity (veh/h)	Deg. Satn	Min. Delay (sec)	Merge Delay (sec)
			% veh/h	veh/h	sec	sec	veh/h	veh/h	v/c	sec

: There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis				
	Initial Queued Demand (veh)	Residual Queued Demand (veh)	Time for Residual Demand to Clear (sec)	Duration of Oversatn (sec)
South: Williams Road				
Lane 1	0.0	0.0	0.0	0.0
East: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0
West: RoadName				
Lane 1	0.0	0.0	0.0	0.0

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LANE SUMMARY

Site: 101 [Int 4: Hendriske Road / Rhode Road_PM Peak - Esc Existing + Prev Devs (Site Folder: 2026 PM Peak - Esc Existing + Prev Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Give-Way (Two-Way)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Sain	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	% %
South: Rhode Road														
Lane 1	21	0.0	21	0.0	1247	0.017	100	5.9	LOS A	0.1	0.4	Full	500	0.0 0.0
Approach	21	0.0	21	0.0		0.017		5.9	LOS A	0.1	0.4			
East: Hendriske Road														
Lane 1	123	0.0	123	0.0	1920	0.064	100	1.8	LOS A	0.0	0.0	Full	500	0.0 0.0
Approach	123	0.0	123	0.0		0.064		1.8	NA	0.0	0.0			
West: Hendriske Road														
Lane 1	66	3.2	66	3.2	1890	0.035	100	0.3	LOS A	0.0	0.1	Full	500	0.0 0.0
Approach	66	3.2	66	3.2		0.035		0.3	NA	0.0	0.1			
All Vehicles	211	1.0	211	1.0		0.064		1.7	NA	0.1	0.4			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Rhode Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Sain	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit	W	E			veh/h	v/c	%	%	
Lane 1	8	13	21	0.0	1247	0.017	100	NA	NA
Approach	8	13	21	0.0		0.017			

East: Hendriske Road

Mov.	L2	T1	Total	%HV	Cap.	Deg. Sain	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit	S	W			veh/h	v/c	%	%	
Lane 1	39	84	123	0.0	1920	0.064	100	NA	NA
Approach	39	84	123	0.0		0.064			

West: Hendriske Road

Mov.	T1	R2	Total	%HV	Cap.	Deg. Sain	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From W To Exit	E	S			veh/h	v/c	%	%	

Lane 1	63	3	66	3.2	1890	0.035	100	NA	NA
Approach	63	3	66	3.2		0.035			

Total	%H/V	Design	Station	(V/C)
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All Vehicles	211	1.0	0.064
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Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Opposing Flow Rate % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Rate veh/h	Capacity veh/h	Des. Satn V/C	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
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South: Rhode Road

Lane 1	0.0	0.0	0.0	0.0
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East: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
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West: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
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LANE SUMMARY

Site: [Int 5: Lang Road / Gabriels Road_PM Peak - Esc Existing + Prev Devs (Site Folder: 2026 PM Peak - Esc Existing + Prev Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	% %
South: Lang Road														
Lane 1	466	0.2	466	0.2	1210	0.385	100	10.5	LOS B	1.4	9.5	Full	500	0.0 0.0
Approach	466	0.2	466	0.2		0.385		10.5	LOS B	1.4	9.5			
East: Gabriels Road														
Lane 1	9	0.0	9	0.0	204	0.046	100	24.5	LOS C	0.2	1.1	Full	500	0.0 0.0
Approach	9	0.0	9	0.0		0.046		24.5	LOS C	0.2	1.1			
North: Lang Road														
Lane 1	277	1.1	277	1.1	1114	0.249	100	10.0	LOS B	0.8	5.3	Full	500	0.0 0.0
Approach	277	1.1	277	1.1		0.249		10.0	LOS B	0.8	5.3			
All Vehicles	753	0.6	753	0.6		0.385		10.5	LOS B	1.4	9.5			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Lang Road

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit	N	E			veh/h	v/c	%	%	
Lane 1	443	23	466	0.2	1210	0.385	100	NA	NA
Approach	443	23	466	0.2		0.385			

East: Gabriels Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit	S	N			veh/h	v/c	%	%	
Lane 1	8	1	9	0.0	204	0.046	100	NA	NA
Approach	8	1	9	0.0		0.046			

North: Lang Road

Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From N To Exit	E	S			veh/h	v/c	%	%	
Lane 1	2	275	277	1.1	1114	0.249	100	NA	NA
Approach	2	275	277	1.1		0.249			

Vehicle	Volume	Weight	Speed
All Vehicles	753	0.6	0.385

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis									
Exit Lane Number	Short Lane Length m	Percent Opposing Lane	Opposing Flow Rate % veh/h pc/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec
Number	Length	Lane				Rate			

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis				
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec

South: Lang Road

Lane 1	0.0	0.0	0.0	0.0
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East: Gabriels Road

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

North: Lang Road

Lane 1	0.0	0.0	0.0	0.0
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LANE SUMMARY

Site: [Int 6: Welgevonden Blvd / Lang Road_PM Peak - Esc Existing + Prev Devs (Site Folder: 2026 PM Peak - Esc Existing + Prev Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (Two-Way)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist] m		m	% %
South: Lang Road														
Lane 1	338	0.0	338	0.0	1317	0.257	100	8.4	LOS A	1.2	8.7	Full	500	0.0 0.0
Approach	338	0.0	338	0.0		0.257		8.4	LOS A	1.2	8.7			
East: Welgevonden Blvd														
Lane 1	80	0.0	80	0.0	1936	0.041	100	0.8	LOS A	0.0	0.0	Full	500	0.0 0.0
Approach	80	0.0	80	0.0		0.041		0.8	NA	0.0	0.0			
West: Welgevonden Blvd														
Lane 1	292	0.0	292	0.0	1738	0.168	100	4.1	LOS A	0.9	6.0	Full	500	0.0 0.0
Approach	292	0.0	292	0.0		0.168		4.1	NA	0.9	6.0			
All Vehicles	709	0.0	709	0.0		0.257		5.8	NA	1.2	8.7			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Lang Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SLOv.	Ov. Lane No.
From S To Exit	W	E			veh/h	v/c	%	%	
Lane 1	325	13	338	0.0	1317	0.257	100	NA	NA
Approach	325	13	338	0.0		0.257			

East: Welgevonden Blvd

Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SLOv.	Ov. Lane No.
From E To Exit	S	W			veh/h	v/c	%	%	
Lane 1	12	68	80	0.0	1936	0.041	100	NA	NA
Approach	12	68	80	0.0		0.041			

West: Welgevonden Blvd

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SLOv.	Ov. Lane No.
From W To Exit	E	S			veh/h	v/c	%	%	

Lane 1	88	203	292	0.0	1738	0.168	100	NA	NA
Approach	88	203	292	0.0		0.168			

	Total	%H/V	Design (V/c)
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All Vehicles	709	0.0	0.257
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Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane	Short Lane	Percent Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Capacity	Design Satn	Min. Delay	Merge Delay
Navigation	Length	Length	sec	sec	veh/h	veh/h	w/c	sec
	m	m			% veh/h	% veh/h		

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial Queued Demand	Residual Queued Demand	Time for Residual Demand to Clear	Duration of Oversatn
veh	veh	sec	sec

South: Lang Road

Lane 1	0.0	0.0	0.0	0.0
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East: Welgevonden Blvd

Lane 1	0.0	0.0	0.0	0.0
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West: Welgevonden Blvd

Lane 1	0.0	0.0	0.0	0.0
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LANE SUMMARY

Site: Int7 [Int 7: R304 / Welgevonden Blvd_PM Peak - Esc Existing + Prev Devs (Site Folder: 2026 PM Peak - Esc Existing + Prev Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 150 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Sain	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist] m		m	% %
South: R304														
Lane 1	1461	2.7	1461	2.7	1272 ¹	1.149	100	185.6	LOS F	181.9	1302.3	Full	500	0.0 95.3
Lane 2	218	0.0	218	0.0	148	1.476	100	498.8	LOS F	35.8	250.7	Short	70	0.0 NA
Approach	1679	2.3	1679	2.3		1.476		226.3	LOS F	181.9	1302.3			
East: Welgevonden Blvd														
Lane 1	177	0.0	177	0.0	298 ¹	0.593	100	77.8	LOS E	12.0	84.2	Short	45	0.0 NA
Lane 2	181	0.0	181	0.0	164 ¹	1.105	100	202.5	LOS F	21.0	147.1	Full	500	0.0 0.0
Approach	358	0.0	358	0.0		1.105		140.9	LOS F	21.0	147.1			
North: R304														
Lane 1	211	0.0	211	0.0	1387	0.152	100	20.3	LOS C	4.3	29.8	Short	100	0.0 NA
Lane 2	1206	0.5	1206	0.5	1295 ¹	0.932	100	34.7	LOS C	79.4	558.2	Full	500	0.0 15.0
Approach	1417	0.4	1417	0.4		0.932		32.6	LOS C	79.4	558.2			
All Vehicles	3454	1.3	3454	1.3		1.476		138.0	LOS F	181.9	1302.3			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab). Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)

South: R304

Mov.	T1	R2	Total	%HV	Cap. veh/h	Deg. Sain v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From S To Exit	N	E							
Lane 1	1461	-	1461	2.7	1272 ¹	1.149	100	NA	NA
Lane 2	-	218	218	0.0	148	1.476	100	100.0	1
Approach	1461	218	1679	2.3		1.476			

East: Welgevonden Blvd

Mov.	L2	R2	Total	%HV	Cap. veh/h	Deg. Sain v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From E To Exit	S	N							
Lane 1	177	-	177	0.0	298 ¹	0.593	100	63.0	2
Lane 2	-	181	181	0.0	164 ¹	1.105	100	NA	NA

Approach 177 181 358 0.0 1.105

North: R304

Mov.	L2	T1	Total	%HV	Cap.	Deg.	Lane	Prob.	Qv.
From N					veh/h	Satn	Util	SL Ov.	Lane
To Exit	E	S				v/c	%	%	No.
Lane 1	211	-	211	0.0	1387	0.152	100	0.0	2
Lane 2	-	1206	1206	0.5	1295 ¹	0.932	100	NA	NA
Approach	211	1206	1417	0.4		0.932			
	Total	%HV	Deg.	Satn	(v/c)				

All Vehicles 3454 1.3 1.476

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

Exit	Station	Percent	Opposing	Critical	Follow-up	Lane	Capacity	Deg.	Min.	Merge
Lane	Lane	Opposing	Flow Rate	Gap	Headway	Flow	Rate	Satn	Delay	Delay
Number	Length	Lane	% veh/h per/h	sec	sec	veh/h	veh/h	v/c	sec	sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial	Residual	Time to	Duration
Queued	Queued	Residual	of
Demand	Demand	Demand	Oversatn
veh	veh	sec	sec

South: R304

Lane 1	0.0	94.7	268.2	NA
Lane 2	0.0	35.1	856.9	NA

East: Welgevonden Blvd

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	8.6	188.1	NA

North: R304

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: Int7 [Int 7: R304 / Welgevonden Blvd_PM Peak - Esc Existing + Prev Devs_Miti (Site Folder: 2026 PM Peak - Esc Existing + Prev Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
South: R304															
Lane 1	756	2.7	756	2.7	1001	0.756	100	30.1	LOS C	26.1	187.1	Full	500	0.0	0.0
Lane 2	705	2.7	705	2.7	933 ¹	0.756	100	24.1	LOS C	24.4	175.0	Short	200	0.0	NA
Lane 3	218	0.0	218	0.0	300	0.726	100	28.9	LOS C	5.9	41.0	Short	70	0.0	NA
Approach	1679	2.3	1679	2.3		0.756		27.4	LOS C	26.1	187.1				
East: Welgevonden Blvd															
Lane 1	177	0.0	177	0.0	640	0.276	100	28.6	LOS C	5.6	39.5	Short	45	0.0	NA
Lane 2	181	0.0	181	0.0	371	0.487	100	40.8	LOS D	7.2	50.6	Full	500	0.0	0.0
Approach	358	0.0	358	0.0		0.487		34.8	LOS C	7.2	50.6				
North: R304															
Lane 1	211	0.0	211	0.0	970	0.217	100	17.9	LOS B	4.9	34.5	Short	100	0.0	NA
Lane 2	603	0.5	603	0.5	1015	0.594	100	15.9	LOS B	18.3	128.3	Short	200	0.0	NA
Lane 3	603	0.5	603	0.5	1015	0.594	100	20.2	LOS C	18.3	128.3	Full	500	0.0	0.0
Approach	1417	0.4	1417	0.4		0.594		18.0	LOS B	18.3	128.3				
All Vehicles	3454	1.3	3454	1.3		0.756		24.3	LOS C	26.1	187.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)

South: R304

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit	N	E			veh/h	v/c	%	%	
Lane 1	756	-	756	2.7	1001	0.756	100	NA	NA
Lane 2	705	-	705	2.7	933 ¹	0.756	100	0.0	1
Lane 3	-	218	218	0.0	300	0.726	100	0.0	2
Approach	1461	218	1679	2.3		0.756			

East: Welgevonden Blvd

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit	S	N			veh/h	v/c	%	%	

Lane 1	177	-	177	0.0	640	0.276	100	0.0	2
Lane 2	-	181	181	0.0	371	0.487	100	NA	NA
Approach	177	181	358	0.0		0.487			

North: R304

From N To Exit	L2 E	T1 S	Total	%HV	Cap. veh/m	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	211	-	211	0.0	970	0.217	100	0.0	2
Lane 2	-	603	603	0.5	1015	0.594	100	0.0	3
Lane 3	-	603	603	0.5	1015	0.594	100	NA	NA
Approach	211	1206	1417	0.4		0.594			
Total %HV/Deg Satn (v/c)									

All Vehicles 3454 1.3 0.756

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Opposing Flow Rate % veh/m per/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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South Exit: R304

Merge Type: Priority

Exit Short Lane	2	200	0.0	780	782	3.01	2.01	603	982 0.614	1.7	4.2
Merge Lane	1	-	100.0	Merge Lane is not Opposed				780	1800 0.433	0.0	0.0

North Exit: R304

Merge Type: Priority

Exit Short Lane	1	200	0.0	886	895	3.04	2.03	756	837 0.904	2.2	11.9
Merge Lane	2	-	100.0	Merge Lane is not Opposed				886	1800 0.492	0.0	0.0

Variable Demand Analysis

Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Overflow sec
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South: R304

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

East: Welgevonden Blvd

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

North: R304

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [Int 8: R44 / Fir Street_PMPeak - Esc Existing + Prev
Devs - Conversion (Site Folder: 2026 PM Peak - Esc Existing +
Prev Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Sain	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	HV %	[Total veh/h]	HV %	veh/h	v/c	%	sec		[Veh]	Dist m		m	%	%
South: R44															
Lane 1	920	2.9	920	2.9	1515	0.607	100	4.9	LOS A	15.5	111.0	Full	490	0.0	0.0
Lane 2	926	3.6	926	3.6	1524	0.607	100	3.7	LOS A	15.6	112.4	Full	490	0.0	0.0
Approach	1845	3.3	1845	3.3		0.607		4.3	LOS A	15.6	112.4				
North: R44															
Lane 1	699	4.1	699	4.1	1519	0.460	100	3.0	LOS A	9.6	69.3	Full	1150	0.0	0.0
Lane 2	699	4.1	699	4.1	1519	0.460	100	3.0	LOS A	9.6	69.3	Full	1150	0.0	0.0
Lane 3	19	5.6	19	5.6	125	0.151	100	14.5	LOS B	0.4	2.9	Short	60	0.0	NA
Approach	1417	4.2	1417	4.2		0.460		3.2	LOS A	9.6	69.3				
West: Fir Street															
Lane 1	72	0.0	72	0.0	124	0.578	100	53.3	LOS D	3.3	23.2	Full	260	0.0	0.0
Approach	72	0.0	72	0.0		0.578		53.3	LOS D	3.3	23.2				
All Vehicles	3334	3.6	3334	3.6		0.607		4.9	LOS A	15.6	112.4				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: R44

Mov.	L2	T1	Total	%HV	Cap.	Deg. Sain	Lane Util.	Prob. SL	OV.
From S To Exit	W	N			veh/h	v/c	%	%	Lane No.
Lane 1	202	718	920	2.9	1515	0.607	100	NA	NA
Lane 2	-	926	926	3.6	1524	0.607	100	NA	NA
Approach	202	1643	1845	3.3		0.607			

North: R44

Mov.	T1	R2	Total	%HV	Cap.	Deg. Sain	Lane Util.	Prob. SL	OV.
From N To Exit	S	W			veh/h	v/c	%	%	Lane No.
Lane 1	699	-	699	4.1	1519	0.460	100	NA	NA
Lane 2	699	-	699	4.1	1519	0.460	100	NA	NA
Lane 3	-	19	19	5.6	125	0.151	100	0.0	2
Approach	1398	19	1417	4.2		0.460			

West: Fir Street

Mov.	L2	R2	Total	%HV	Cap.	Deq.	Lane	Prob.	Qv.
From W To Exit	N	S			veh/h	Sec	Util. %	SL Ov. %	Lane No.
Lane 1	19	53	72	0.0	124	0.578	100	NA	NA
Approach	19	53	72	0.0		0.578			

Total	%HV	Deq.	Sec	Min	(v/c)
All Vehicles	3334	3.6			0.607

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Station Lane m	Percent Oppng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Category	Category Flow Rate veh/h	Deq. Sec	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
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South: R44

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

North: R44

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

West: Fir Street

Lane 1	0.0	0.0	0.0	0.0
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Appendix E

SIDRA Analysis 2026 Total Traffic

LANE SUMMARY

Site: Int1 [Int 1: R44 / Hendriske Road_AM Peak_Duel - Esc Existing + All Devs (Site Folder: 2026 AM Peak - Esc Existing + All Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist] m		m	%	%
South: R44															
Lane 1	109	0.0	109	0.0	1543	0.071	100	6.3	LOS A	0.4	2.8	Short	80	0.0	NA
Lane 2	193	1.3	193	1.3	608	0.317	35 ⁶	21.3	LOS C	5.1	36.0	Full	500	0.0	0.0
Lane 3	538	1.3	538	1.3	602	0.894	100	36.4	LOS D	22.1	156.6	Full	500	0.0	0.0
Approach	840	1.1	840	1.1		0.894		29.0	LOS C	22.1	156.6				
East: RoadName															
Lane 1	2	0.0	2	0.0	779	0.003	100	14.8	LOS B	0.0	0.2	Full	500	0.0	0.0
Approach	2	0.0	2	0.0		0.003		14.8	LOS B	0.0	0.2				
North: R44															
Lane 1	559	1.0	559	1.0	609	0.918	100	40.5	LOS D	24.4	172.2	Full	500	0.0	0.0
Lane 2	559	1.0	559	1.0	609	0.918	100	40.5	LOS D	24.4	172.2	Full	500	0.0	0.0
Lane 3	36	0.0	36	0.0	116	0.309	100	42.9	LOS D	1.3	9.0	Short	80	0.0	NA
Approach	1154	1.0	1154	1.0		0.918		40.6	LOS D	24.4	172.2				
West: Hendriske Road															
Lane 1	558	0.0	558	0.0	463 ¹	1.206	100	241.9	LOS F	60.8	425.4	Short	20	0.0	NA
Lane 2	555	0.0	555	0.0	460 ¹	1.206	100	241.9	LOS F	60.4	423.0	Full	500	0.0	0.0
Approach	1113	0.0	1113	0.0		1.206		241.9	LOS F	60.8	425.4				
All Vehicles	3108	0.7	3108	0.7		1.206		109.5	LOS F	60.8	425.4				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab). Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

⁶ Lane under-utilisation due to downstream effects

Approach Lane Flows (veh/h)

South: R44

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit:	W	N	E			veh/h	v/c	%	%	
Lane 1	109	-	-	109	0.0	1543	0.071	100	0.0	2
Lane 2	-	193	-	193	1.3	608	0.317	35 ⁶	NA	NA
Lane 3	-	537	1	538	1.3	602	0.894	100	NA	NA

Approach 109 729 1 840 1.1 0.894

East: RoadName

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit	S	N			veh/h	v/c	%	%	
Lane 1	1	1	2	0.0	779	0.003	100	NA	NA
Approach	1	1	2	0.0		0.003			

North: R44

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From N To Exit	E	S	W			veh/h	v/c	%	%	
Lane 1	1	558	-	559	1.0	609	0.918	100	NA	NA
Lane 2	-	559	-	559	1.0	609	0.918	100	NA	NA
Lane 3	-	-	36	36	0.0	116	0.309	100	0.0	2
Approach	1	1117	36	1154	1.0		0.918			

West: Hendriske Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From W To Exit	N	S			veh/h	v/c	%	%	
Lane 1	57	501	558	0.0	463	1.206	100	100.0	2
Lane 2	-	555	555	0.0	460	1.206	100	NA	NA
Approach	57	1056	1113	0.0		1.206			
Total	%HV/Deg. Satn (v/c)								

All Vehicles 3108 0.7 1.206

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.
- 6 Lane under-utilisation due to downstream effects

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opposing Opp In Lane %	Flow Rate veh/h	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity veh/h	Grade v/c	Min. Delay sec	Merge Delay sec	
North Exit: R44												
Merge Type: Priority												
Exit Short Lane	1	60	0.0	562	565	3.02	2.01	216	1206	0.179	1.0	1.4
Merge Lane	2	-	100.0	Merge Lane is not Opposed				562	1800	0.312	0.0	0.0

Variable Demand Analysis

	Initial Queue	Residual Queue	Time to Residual Demand to Clear	Duration of Oversat
	veh	veh	sec	sec
South: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
East: RoadName				
Lane 1	0.0	0.0	0.0	0.0
North: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

Lane 3	0.0	0.0	0.0	0.0
West: Hendriske Road				
Lane 1	0.0	47.6	370.3	NA
Lane 2	0.0	47.3	370.3	NA

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Approach Lane Flows (veh/h)										
South: R44										
Flow	L2	T1	R2	Total	PHFV		Disc.	Lane	Pro.	OV
From							Sign	Util.	St.	Lane
To Exit	W	N	E			Cap.	%	%	%	No.
						veh/mi				
Lane 1	109	-	-	109	0.0	1409	0.078	100	0.0	2
Lane 2	-	192	-	192	1.3	696	0.276	35 ⁵	NA	NA
Lane 3	-	537	1	538	1.3	692	0.778	100	NA	NA
Approach	109	729	1	840	1.1		0.778			

East: RoadName

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From E					veh/h	Satn	Util.	SL Ov.	Lane
To Exit:	S	N				v/c	%	%	No.
Lane 1	1	1	2	0.0	624	0.003	100	NA	NA
Approach	1	1	2	0.0		0.003			

North: R44

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From N						veh/h	Satn	Util.	SL Ov.	Lane
To Exit:	E	S	W				v/c	%	%	No.
Lane 1	1	558	-	559	1.0	697	0.802	100	NA	NA
Lane 2	-	559	-	559	1.0	697	0.802	100	NA	NA
Lane 3	-	-	36	36	0.0	190	0.189	100	0.0	2
Approach	1	1117	36	1154	1.0		0.802			

West: Hendriske Road

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From W					veh/h	Satn	Util.	SL Ov.	Lane
To Exit:	N	S				v/c	%	%	No.
Lane 1	57	500	557	0.0	630	0.884	100	43.4	2
Lane 2	-	555	555	0.0	628	0.884	100	NA	NA
Approach	57	1056	1113	0.0		0.884			

Total	%HV	Deg. Satn	(v/c)
All Vehicles	3108	0.7	0.884

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects

Merge Analysis

Exit	Short	Percent	Opposing	Critical	Follow-up	Lane Capacity	Deg.	Min.	Merge
Lane	Lane	Opng in	Flow Rate	Gap	Headway	Flow	Satn	Delay	Delay
Number	Length	Lane	% veh/h	sec	sec	veh/h	v/c	sec	sec
	m								
North Exit: R44									
Merge Type: Priority									
Exit Short Lane	1	60	0.0	567	570	3.02	2.01	220	1200 0.184 1.0 1.4
Merge Lane	2	-	100.0	Merge Lane is not Opposed			567	1800 0.315 0.0 0.0	

Variable Demand Analysis

	Initial	Residual	Time for	Duration
	Queued	Queued	Residual	of
	Demand	Demand	Demand	Oversatn
	veh	veh	to Clear	sec
			sec	
South: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
East: RoadName				
Lane 1	0.0	0.0	0.0	0.0
North: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0

Lane 2	0.0	0.0	0.0	0.0
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LANE SUMMARY

Site: [Int 2: Hendriske Road / Tolbos Road_AM Peak - Esc Existing + All Devs (Site Folder: 2026 AM Peak - Esc Existing + All Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	% %
South: Hendriske Road														
Lane 1	260	0.0	260	0.0	757	0.343	100	12.9	LOS B	1.3	9.0	Full	500	0.0 0.0
Approach	260	0.0	260	0.0		0.343		12.9	LOS B	1.3	9.0			
East: Tolbos Road														
Lane 1	107	0.0	107	0.0	609	0.176	100	12.7	LOS B	0.6	4.1	Full	500	0.0 0.0
Approach	107	0.0	107	0.0		0.176		12.7	LOS B	0.6	4.1			
North: Hendriske Road														
Lane 1	138	0.8	138	0.8	641	0.215	100	13.0	LOS B	0.7	5.1	Full	500	0.0 0.0
Approach	138	0.8	138	0.8		0.215		13.0	LOS B	0.7	5.1			
West: Tolbos Road														
Lane 1	77	0.0	77	0.0	152	0.505	100	51.5	LOS F	2.4	17.0	Full	500	0.0 0.0
Approach	77	0.0	77	0.0		0.505		51.5	LOS F	2.4	17.0			
All Vehicles	582	0.2	582	0.2		0.505		18.0	LOS C	2.4	17.0			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Prob. Ov.	Ov. Lane No.
From S To Exit	W	N	E			veh/h	v/c	%	%	%	
Lane 1	5	253	2	260	0.0	757	0.343	100	NA	NA	
Approach	5	253	2	260	0.0		0.343				

East: Tolbos Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Prob. Ov.	Ov. Lane No.
From E To Exit	S	N			veh/h	v/c	%	%	%	
Lane 1	13	95	107	0.0	609	0.176	100	NA	NA	
Approach	13	95	107	0.0		0.176				

North: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Prob. Ov.	Ov. Lane No.
From N To Exit	E	S	W			veh/h	v/c	%	%	%	

Lane 1	46	85	6	138	0.8	641	0.215	100	NA	NA
Approach	46	85	6	138	0.8		0.215			

West: Tolbos Road

Mov.	LT	Total	%HV			Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Op. Lane No.
From W To Exit	N									
Lane 1	77	77	0.0			152	0.505	100	NA	NA
Approach	77	77	0.0				0.505			
	Total	%HV	Deg. Satn v/c							
All Vehicles	582	0.2		0.505						

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane	Percent Oppng in Lane	Flow Rate	Critical Gap	Follow-up Headway	Lane Capacity Flow Rate	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
			% veh/h pcu/h	sec	sec	veh/h	veh/h	sec	sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial Queued Demand	Residual Queued Demand	Time for Residual Demand to Clear	Duration of Oversatn
veh	veh	sec	sec
South: Hendriske Road			
Lane 1	0.0	0.0	0.0
East: Tolbos Road			
Lane 1	0.0	0.0	0.0
North: Hendriske Road			
Lane 1	0.0	0.0	0.0
West: Tolbos Road			
Lane 1	0.0	0.0	0.0

LANE SUMMARY

Site: v [Int 2: Hendriske Road / Tolbos Road_AM Peak - Esc
Existing + All Devs - Conversion (2) (Site Folder: 2026 AM Peak -
Esc Existing + All Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Give-Way (Two-Way)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist] m		m	% %
South: Hendriske Road														
Lane 1	260	0.0	260	0.0	1944	0.134	100	0.2	LOS A	0.0	0.1	Full	500	0.0 0.0
Approach	260	0.0	260	0.0		0.134		0.2	NA	0.0	0.1			
East: Tolbos Road														
Lane 1	107	0.0	107	0.0	747	0.144	100	8.0	LOS A	0.5	3.6	Full	500	0.0 0.0
Approach	107	0.0	107	0.0		0.144		8.0	LOS A	0.5	3.6			
North: Hendriske Road														
Lane 1	138	0.8	138	0.8	1875	0.074	100	2.2	LOS A	0.1	0.5	Full	500	0.0 0.0
Approach	138	0.8	138	0.8		0.074		2.2	NA	0.1	0.5			
West: Tolbos Road														
Lane 1	77	0.0	77	0.0	1307	0.059	100	6.4	LOS A	0.2	1.6	Full	500	0.0 0.0
Approach	77	0.0	77	0.0		0.059		6.4	LOS A	0.2	1.6			
All Vehicles	582	0.2	582	0.2		0.144		2.9	NA	0.5	3.6			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit	W	N	E			veh/h	v/c	%	%	
Lane 1	5	253	2	260	0.0	1944	0.134	100	NA	NA
Approach	5	253	2	260	0.0		0.134			

East: Tolbos Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit	S	N			veh/h	v/c	%	%	
Lane 1	13	95	107	0.0	747	0.144	100	NA	NA
Approach	13	95	107	0.0		0.144			

North: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap.	Deq.	Lane	Prob.	Ov.
From N						veh/h	Satn	Util.	SL	Lane
To Exit:	E	S	W				v/c	%	%	No.
Lane 1	46	85	6	138	0.8	1875	0.074	100	NA	NA
Approach	46	85	6	138	0.8		0.074			

West: Tolbos Road

Mov.	L2	Total	%HV	Cap.	Deq.	Lane	Prob.	Ov.
From W				veh/h	Satn	Util.	SL	Lane
To Exit:	N				v/c	%	%	No.
Lane 1	77	77	0.0	1307	0.059	100	NA	NA
Approach	77	77	0.0		0.059			

All Vehicles 582 0.2 0.144

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit	Short	Percent	Opposing	Critical	Follow-up	Lane	Capacity	Deq.	Min.	Merge
Lane	Lane	Oppng in	Flow Rate	Gap	Headway	Flow		Satn	Delay	Delay
Number	Length	Lane	% veh/h pcu/h	sec	sec	veh/h	veh/h	v/c	sec	sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial	Residual	Time for	Duration
Queued	Queued	Residual	of
Demand	Demand	Demand	Oversatn
veh	veh	to Clear	sec
		sec	

South: Hendriske Road

Lane 1 0.0 0.0 0.0 0.0

East: Tolbos Road

Lane 1 0.0 0.0 0.0 0.0

North: Hendriske Road

Lane 1 0.0 0.0 0.0 0.0

West: Tolbos Road

Lane 1 0.0 0.0 0.0 0.0

LANE SUMMARY

Site: v [Int 2: Hendriske Road / Tolbos Road_AM Peak - Esc Existing + All Devs - Conversion (Site Folder: 2026 AM Peak - Esc Existing + All Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (Two-Way)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist] m		m	% %
South: Hendriske Road														
Lane 1	260	0.0	260	0.0	1944	0.134	100	0.2	LOS A	0.0	0.1	Full	500	0.0 0.0
Approach	260	0.0	260	0.0		0.134		0.2	NA	0.0	0.1			
East: Tolbos Road														
Lane 1	107	0.0	107	0.0	649	0.165	100	10.7	LOS B	0.6	4.2	Full	500	0.0 0.0
Approach	107	0.0	107	0.0		0.165		10.7	LOS B	0.6	4.2			
North: Hendriske Road														
Lane 1	138	0.8	138	0.8	1875	0.074	100	2.2	LOS A	0.1	0.5	Full	500	0.0 0.0
Approach	138	0.8	138	0.8		0.074		2.2	NA	0.1	0.5			
West: Tolbos Road														
Lane 1	77	0.0	77	0.0	1118	0.069	100	9.1	LOS A	0.3	1.9	Full	500	0.0 0.0
Approach	77	0.0	77	0.0		0.069		9.1	LOS A	0.3	1.9			
All Vehicles	582	0.2	582	0.2		0.165		3.8	NA	0.6	4.2			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From S							Satn	Util.	SL Ov.	Lane
To Exit:	W	N	E			veh/h	v/c	%	%	No.
Lane 1	5	253	2	260	0.0	1944	0.134	100	NA	NA
Approach	5	253	2	260	0.0		0.134			

East: Tolbos Road

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From E						Satn	Util.	SL Ov.	Lane
To Exit:	S	N			veh/h	v/c	%	%	No.
Lane 1	13	95	107	0.0	649	0.165	100	NA	NA
Approach	13	95	107	0.0		0.165			

North: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Qv.
From N						veh/h	Satn	Util.	SL Ov.	Lane
To Exit	E	S	W				v/c	%	%	No.
Lane 1	46	85	6	138	0.8	1875	0.074	100	NA	NA
Approach	46	85	6	138	0.8		0.074			

West: Tolbos Road

Mov.	L2	Total	%HV	Cap.	Deg.	Lane	Prob.	Qv.
From W				veh/h	Satn	Util.	SL Ov.	Lane
To Exit	N				v/c	%	%	No.
Lane 1	77	77	0.0	1118	0.069	100	NA	NA
Approach	77	77	0.0		0.069			
Total		%HV/Deg. Satn (v/c)						

All Vehicles 582 0.2 0.165

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit	Short	Percent	Opposing	Critical	Follow-up	Lane Capacity	Deg.	Min.	Merge
Lane	Lane	Opp in	Flow Rate	Cap	Headway	Flow	Satn	Delay	Delay
Number	Length	Lane				Rate			
	m		%veh/h	sec	sec	veh/h	v/c	sec	sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial	Residual	Time for	Duration
Queued	Queued	Residual	of
Demand	Demand	Demand	Oversatn
veh	veh	to Clear	sec
		sec	

South: Hendriske Road

Lane 1 0.0 0.0 0.0 0.0

East: Tolbos Road

Lane 1 0.0 0.0 0.0 0.0

North: Hendriske Road

Lane 1 0.0 0.0 0.0 0.0

West: Tolbos Road

Lane 1 0.0 0.0 0.0 0.0

LANE SUMMARY

Site: [Int 3: Hendriske Road / Williams Road_AM Peak - Esc Existing + All Devs (Site Folder: 2026 AM Peak - Esc Existing + All Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist] m		m	%	%
South: Williams Road															
Lane 1	58	1.8	58	1.8	383	0.151	100	16.6	LOS C	0.5	3.7	Full	500	0.0	0.0
Approach	58	1.8	58	1.8		0.151		16.6	LOS C	0.5	3.7				
East: Hendriske Road															
Lane 1	98	1.1	98	1.1	525	0.186	100	14.2	LOS B	0.6	4.5	Full	500	0.0	0.0
Approach	98	1.1	98	1.1		0.186		14.2	LOS B	0.6	4.5				
West: RoadName															
Lane 1	214	0.0	214	0.0	696	0.307	100	13.1	LOS B	1.1	7.9	Full	500	0.0	0.0
Approach	214	0.0	214	0.0		0.307		13.1	LOS B	1.1	7.9				
All Vehicles	369	0.6	369	0.6		0.307		14.0	LOS B	1.1	7.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Williams Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit:	W	E			veh/h	v/c	%	%	
Lane 1	6	52	58	1.8	383	0.151	100	NA	NA
Approach	6	52	58	1.8		0.151			

East: Hendriske Road

Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit:	S	W			veh/h	v/c	%	%	
Lane 1	34	64	98	1.1	525	0.186	100	NA	NA
Approach	34	64	98	1.1		0.186			

West: RoadName

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From W To Exit:	E	S			veh/h	v/c	%	%	
Lane 1	209	4	214	0.0	696	0.307	100	NA	NA
Approach	209	4	214	0.0		0.307			

Total	W/M	Design	Service
All Vehicles	369	0.6	0.307

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis											
Exit Lane Number	Short Lane Length m	Percent Oppng in Lane	Flow Rate %veh/h pcu/h	Critical Gap sec	Following Highway Flow Rate sec veh/h	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec		

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis				
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Williams Road				
Lane 1	0.0	0.0	0.0	0.0
East: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0
West: RoadName				
Lane 1	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101 [Int 4: Hendriske Road / Rhode Road_AM Peak - Esc
Existing + All Devs (Site Folder: 2026 AM Peak - Esc Existing +
All Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Give-Way (Two-Way)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Gap	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist. m]		m	% %
South: Rhode Road														
Lane 1	22	0.0	22	0.0	1097	0.020	100	6.2	LOS A	0.1	0.5	Full	500	0.0 0.0
Approach	22	0.0	22	0.0		0.020		6.2	LOS A	0.1	0.5			
East: Hendriske Road														
Lane 1	66	0.0	66	0.0	1896	0.035	100	2.0	LOS A	0.0	0.2	Full	500	0.0 0.0
Approach	66	0.0	66	0.0		0.035		2.0	NA	0.0	0.2			
North: RoadName														
Lane 1	49	0.0	49	0.0	1197	0.041	100	6.1	LOS A	0.2	1.1	Full	500	0.0 0.0
Approach	49	0.0	49	0.0		0.041		6.1	LOS A	0.2	1.1			
West: Hendriske Road														
Lane 1	163	0.0	163	0.0	1931	0.085	100	0.8	LOS A	0.0	0.2	Full	500	0.0 0.0
Approach	163	0.0	163	0.0		0.085		0.8	NA	0.0	0.2			
All Vehicles	301	0.0	301	0.0		0.085		2.3	NA	0.2	1.1			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Rhode Road

Mov.	L2	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit	W	E			Cap. veh/h	v/c	%	%	
Lane 1	9	13	22	0.0	1097	0.020	100	NA	NA
Approach	9	13	22	0.0		0.020			

East: Hendriske Road

Mov.	L2	T1	R2	Total	%HV		Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit	S	W	N			Cap. veh/h	v/c	%	%	
Lane 1	20	43	3	66	0.0	1896	0.035	100	NA	NA
Approach	20	43	3	66	0.0		0.035			

North: RoadName

Mov.	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From N To Exit:	E	W							
Lane 1	32	18	49	0.0	1197	0.041	100	NA	NA
Approach	32	18	49	0.0		0.041			

West: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From W To Exit:	N	E	S							
Lane 1	21	139	3	163	0.0	1931	0.085	100	NA	NA
Approach	21	139	3	163	0.0		0.085			

Total	%HV	Deg. Satn (v/c)								
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All Vehicles 301 0.0 0.085

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Station Lane Length m	Percent Oppng In Lane	Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
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South: Rhode Road

Lane 1 0.0 0.0 0.0 0.0

East: Hendriske Road

Lane 1 0.0 0.0 0.0 0.0

North: RoadName

Lane 1 0.0 0.0 0.0 0.0

West: Hendriske Road

Lane 1 0.0 0.0 0.0 0.0

LANE SUMMARY

Site: [Int 5: Lang Road / Gabriels Road_AM Peak - Esc Existing + All Devs (Site Folder: 2026 AM Peak - Esc Existing + All Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist] m		m	%	%
South: Lang Road															
Lane 1	337	0.0	337	0.0	806	0.418	100	13.3	LOS B	1.7	11.9	Full	500	0.0	0.0
Approach	337	0.0	337	0.0		0.418		13.3	LOS B	1.7	11.9				
East: Gabriels Road															
Lane 1	78	0.0	78	0.0	270	0.289	100	24.3	LOS C	1.1	7.9	Full	500	0.0	0.0
Approach	78	0.0	78	0.0		0.289		24.3	LOS C	1.1	7.9				
North: Lang Road															
Lane 1	880	0.5	880	0.5	912	0.965	100	53.2	LOS F	20.1	141.5	Full	500	0.0	0.0
Approach	880	0.5	880	0.5		0.965		53.2	LOS F	20.1	141.5				
All Vehicles	1295	0.3	1295	0.3		0.965		41.1	LOS E	20.1	141.5				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay; Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Lang Road

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit:	N	E			veh/h	v/c	%	%	
Lane 1	328	8	337	0.0	806	0.418	100	NA	NA
Approach	328	8	337	0.0		0.418			

East: Gabriels Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit:	S	N			veh/h	v/c	%	%	
Lane 1	34	44	78	0.0	270	0.289	100	NA	NA
Approach	34	44	78	0.0		0.289			

North: Lang Road

Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From N To Exit:	E	S			veh/h	v/c	%	%	
Lane 1	48	832	880	0.5	912	0.965	100	NA	NA
Approach	48	832	880	0.5		0.965			

	Total	%H/V	Seg. Sat. (v/c)
All Vehicles	1295	0.3	0.965

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis										
Exit Lane Number	Station Lane Length m	Percent Opposing Lane	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Lane Capacity veh/h	Seg. Sat. v/c	Min. Satn Delay sec	Merge Delay sec
There are no Exit Short Lanes for Merge Analysis at this Site.										

Variable Demand Analysis				
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Lang Road				
Lane 1	0.0	0.0	0.0	0.0
East: Gabriels Road				
Lane 1	0.0	0.0	0.0	0.0
North: Lang Road				
Lane 1	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: v [Int 5: Lang Road / Gabriels Road_AM Peak - Esc Existing + All Devs - Conversion (2) (Site Folder: 2026 AM Peak - Esc Existing + All Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (Two-Way)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	HV %	[Total veh/h]	HV %	veh/h	v/c	%	sec		[Veh]	Dist m		m	%	%
South: Lang Road															
Lane 1	337	0.0	337	0.0	1845	0.183	100	0.6	LOS A	0.2	1.2	Full	500	0.0	0.0
Approach	337	0.0	337	0.0		0.183		0.6	NA	0.2	1.2				
East: Gabriels Road															
Lane 1	78	0.0	78	0.0	281	0.277	100	20.9	LOS C	0.9	6.6	Full	500	0.0	0.0
Approach	78	0.0	78	0.0		0.277		20.9	LOS C	0.9	6.6				
North: Lang Road															
Lane 1	880	0.5	880	0.5	1939	0.454	100	0.5	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	880	0.5	880	0.5		0.454		0.5	NA	0.0	0.0				
All Vehicles	1295	0.3	1295	0.3		0.454		1.7	NA	0.9	6.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Lang Road

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit	N	E			veh/h	v/c	%	%	
Lane 1	328	8	337	0.0	1845	0.183	100	NA	NA
Approach	328	8	337	0.0		0.183			

East: Gabriels Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit	S	N			veh/h	v/c	%	%	
Lane 1	34	44	78	0.0	281	0.277	100	NA	NA
Approach	34	44	78	0.0		0.277			

North: Lang Road

Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From N To Exit	E	S			veh/h	v/c	%	%	

Lane 1	48	832	880	0.5	1939	0.454	100	NA	NA
Approach	48	832	880	0.5		0.454			

Total %HV Deg Satn (v/c)

All Vehicles 1295 0.3 0.454

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppng in Lane	Flow Rate %veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial Queued Demand Veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
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South: Lang Road

Lane 1	0.0	0.0	0.0	0.0
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East: Gabriels Road

Lane 1	0.0	0.0	0.0	0.0
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North: Lang Road

Lane 1	0.0	0.0	0.0	0.0
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LANE SUMMARY

▼ Site: v [Int 5: Lang Road / Gabriels Road_AM Peak - Esc Existing + All Devs - Conversion (Site Folder: 2026 AM Peak - Esc Existing + All Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Give-Way (Two-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total	HV]	[Total	HV]						[Veh	Dist]				
	veh/h	%	veh/h	%		veh/h	v/c			%	sec				m
South: Lang Road															
Lane 1	337	0.0	337	0.0	1845	0.183	100	0.6	LOS A	0.2	1.2	Full	500	0.0	0.0
Approach	337	0.0	337	0.0		0.183		0.6	NA	0.2	1.2				
East: Gabriels Road															
Lane 1	78	0.0	78	0.0	376	0.207	100	14.3	LOS B	0.7	4.7	Full	500	0.0	0.0
Approach	78	0.0	78	0.0		0.207		14.3	LOS B	0.7	4.7				
North: Lang Road															
Lane 1	880	0.5	880	0.5	1939	0.454	100	0.5	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	880	0.5	880	0.5		0.454		0.5	NA	0.0	0.0				
All Vehicles	1295	0.3	1295	0.3		0.454		1.3	NA	0.7	4.7				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Lang Road

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit	N	E			veh/h	v/c	%	%	
Lane 1	328	8	337	0.0	1845	0.183	100	NA	NA
Approach	328	8	337	0.0		0.183			

East: Gabriels Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit	S	N			veh/h	v/c	%	%	
Lane 1	34	44	78	0.0	376	0.207	100	NA	NA
Approach	34	44	78	0.0		0.207			

North: Lang Road

Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From N To Exit	E	S			veh/h	v/c	%	%	

Lane 1	48	832	880	0.5	1939	0.454	100	NA	NA
Approach	48	832	880	0.5		0.454			

Total	1295	0.3	0.454
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All Vehicles	1295	0.3	0.454
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Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length (m)	Percent Opposing Flow Rate % veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
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South: Lang Road

Lane 1	0.0	0.0	0.0	0.0
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East: Gabriels Road

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

North: Lang Road

Lane 1	0.0	0.0	0.0	0.0
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Project: C:\Users\Armandt.VanStraten\Zutari\1001918 - Cloeteville - Documents\05 Deliver\510 Reports\2. Status Quo Analysis\Status Quo_Transport\Sidra Analysis\1001918-Cloeteville.sip9

LANE SUMMARY

10 Site: [Int 6: Welgevonden Blvd / Lang Road_AM Peak - Esc Existing + All Devs (Site Folder: 2026 AM Peak - Esc Existing + All Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (Two-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.	
	[Total veh/h	HV %	[Total veh/h	HV %						[Veh	Dist] m			%	%
South: Lang Road															
Lane 1	244	0.9	244	0.9	1173	0.208	100	8.9	LOS A	0.9	6.5	Full	500	0.0	0.0
Approach	244	0.9	244	0.9		0.208	8.9	LOS A	0.9	6.5					
East: Welgevonden Blvd															
Lane 1	121	0.0	121	0.0	1938	0.062	100	0.7	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	121	0.0	121	0.0		0.062	0.7	NA	0.0	0.0					
West: Welgevonden Blvd															
Lane 1	704	1.0	704	1.0	1622	0.434	100	5.7	LOS A	2.9	20.4	Full	500	0.0	0.0
Approach	704	1.0	704	1.0		0.434	5.7	NA	2.9	20.4					
All Vehicles	1069	0.9	1069	0.9		0.434		5.9	NA	2.9	20.4				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Lang Road

Mov.	L2	R2	Left	RTLV	Cap.	Deg.	Lane	Prob.	Ov.
From S To Exit	W	E			veh/h	Satn v/c	Util.	SLOV %	Lane No.
Lane 1	237	7	244	0.9	1173	0.208	100	NA	NA
Approach	237	7	244	0.9		0.208			

East: Welgevonden Blvd

Mov.	L2	T1	Total	%HV		Deg. Sat'n	Lane Util.	Prob. SL	OV. Lane No.
From E To Exit	S	W			Cap. veh/h	v/c	%	%	
Lane 1	15	106	121	0.0	1938	0.062	100	NA	NA
Approach	15	106	121	0.0		0.062			

West: Welgevonden Blvd

Mov.	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Leave Utl. %	Prob. SL Ov. %	Ov. Leave No.
From W To Exit	E	S							

Lane 1	42	662	704	1.0	1622	0.434	100	NA	NA
Approach	42	662	704	1.0		0.434			

	Total	%HV	Deg Satn	(v/c)
All Vehicles	1069	0.9		0.434

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis										
Exit Lane Number	Short Lane Length m	Percent Oppng In Lane	Flow Rate veh/h	Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis				
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Lang Road				
Lane 1	0.0	0.0	0.0	0.0
East: Welgevonden Blvd				
Lane 1	0.0	0.0	0.0	0.0
West: Welgevonden Blvd				
Lane 1	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: Int7 [Int 7: R304 / Welgevonden Blvd_AM Peak - Esc
Existing + All Devs_Miti (Site Folder: 2026 AM Peak - Esc
Existing + All Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
South: R304															
Lane 1	618	1.5	618	1.5	901	0.685	100	25.7	LOS C	21.2	150.6	Full	500	0.0	0.0
Lane 2	589	1.5	589	1.5	859 ¹	0.685	100	22.9	LOS C	20.2	143.6	Short	200	0.0	NA
Lane 3	264	0.0	264	0.0	361	0.732	100	32.7	LOS C	7.6	53.4	Short	70	0.0	NA
Approach	1471	1.2	1471	1.2		0.732		25.8	LOS C	21.2	150.6				
East: Welgevonden Blvd															
Lane 1	203	0.0	203	0.0	743	0.273	100	25.1	LOS C	6.0	42.0	Short	45	0.0	NA
Lane 2	258	0.0	258	0.0	371	0.694	100	43.5	LOS D	11.0	77.2	Full	500	0.0	0.0
Approach	461	0.0	461	0.0		0.694		35.4	LOS D	11.0	77.2				
North: R304															
Lane 1	366	0.6	366	0.6	863	0.424	100	22.7	LOS C	10.7	75.0	Short	100	0.0	NA
Lane 2	656	2.3	656	2.3	896	0.732	100	20.9	LOS C	23.3	166.6	Short	200	0.0	NA
Lane 3	656	2.3	656	2.3	896	0.732	100	27.5	LOS C	23.3	166.6	Full	500	0.0	0.0
Approach	1679	1.9	1679	1.9		0.732		23.9	LOS C	23.3	166.6				
All Vehicles	3611	1.4	3611	1.4		0.732		26.1	LOS C	23.3	166.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)

South: R304

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit:	N	E			veh/h	v/c	%	%	
Lane 1	618	-	618	1.5	901	0.685	100	NA	NA
Lane 2	589	-	589	1.5	859 ¹	0.685	100	0.0	1
Lane 3	-	264	264	0.0	361	0.732	100	0.0	2
Approach	1206	264	1471	1.2		0.732			

East: Welgevonden Blvd

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit:	S	N			veh/h	v/c	%	%	

Lane 1	203	-	203	0.0	743	0.273	100	0.0	2
Lane 2	-	258	258	0.0	371	0.694	100	NA	NA
Approach	203	258	461	0.0	0.694				

North: R304

Mov.	L2	T1	Total	%HV	Cap.	Deg.	Lane	Prob.	Op.
From N					veh/h	Satn	Util.	SL	Lane
To Exit:	E	S				v/c	%	%	No.
Lane 1	366	-	366	0.6	863	0.424	100	0.0	2
Lane 2	-	656	656	2.3	896	0.732	100	0.0	3
Lane 3	-	656	656	2.3	896	0.732	100	NA	NA
Approach	366	1313	1679	1.9	0.732				
Total %HV/Deg.Satn(v/c)									

All Vehicles 3611 1.4 0.732

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppg in Lane	Opposing Flow Rate % veh/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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South Exit: R304

Merge Type: Priority

Exit Short Lane	2	200	0.0	859	867	3.03	2.02	656	870 0.754	2.1	6.5
Merge Lane	1	-	100.0	Merge Lane is not Opposed				859	1800 0.477	0.0	0.0

North Exit: R304

Merge Type: Priority

Exit Short Lane	1	200	0.0	847	851	3.02	2.01	618	897 0.689	2.0	5.5
Merge Lane	2	-	100.0	Merge Lane is not Opposed				847	1800 0.470	0.0	0.0

Variable Demand Analysis

Initial Queued Demand	Residual Queued Demand	Time for Residual Demand to Clear	Duration of Oversatn
veh	veh	sec	sec

South: R304

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

East: Welgevonden Blvd

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

North: R304

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [Int 8: R44 / Fir Street_AMPeak - Esc Existing + All Devs - Conversion (Site Folder: 2026 AM Peak - Esc Existing + All Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist. m]		m	%	%
South: R44															
Lane 1	598	3.6	598	3.6	1391	0.430	100	7.1	LOS A	13.3	96.3	Full	490	0.0	0.0
Lane 2	600	4.0	600	4.0	1394	0.430	100	6.6	LOS A	13.4	96.8	Full	490	0.0	0.0
Approach	1198	3.8	1198	3.8		0.430		6.8	LOS A	13.4	96.8				
North: R44															
Lane 1	1212	2.1	1212	2.1	1411	0.859	100	12.2	LOS B	50.2	357.5	Full	1150	0.0	0.0
Lane 2	1027	2.1	1027	2.1	1196 ¹	0.859	100	21.1	LOS C	44.5	317.3	Full	1150	0.0	0.0
Lane 3	58	0.0	58	0.0	243	0.238	100	23.7	LOS C	1.6	11.1	Short	60	0.0	NA
Approach	2297	2.1	2297	2.1		0.859		16.5	LOS B	50.2	357.5				
West: Fir Street															
Lane 1	265	0.8	265	0.8	308	0.862	100	67.1	LOS E	17.0	119.6	Full	260	0.0	0.0
Approach	265	0.8	265	0.8		0.862		67.1	LOS E	17.0	119.6				
All Vehicles	3760	2.5	3760	2.5		0.862		17.0	LOS B	50.2	357.5				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)

South: R44									
Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit	W	N			veh/h	v/c	%	%	
Lane 1	56	542	598	3.6	1391	0.430	100	NA	NA
Lane 2	-	600	600	4.0	1394	0.430	100	NA	NA
Approach	56	1142	1198	3.8		0.430			
North: R44									
Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From N To Exit	S	W			veh/h	v/c	%	%	
Lane 1	1212	-	1212	2.1	1411	0.859	100	NA	NA
Lane 2	1027	-	1027	2.1	1196 ¹	0.859	100	NA	NA
Lane 3	-	58	58	0.0	243	0.238	100	0.0	2

Approach 2239 58 2297 2.1 0.859

West: Fir Street

Mov.	L2	R2	Total	%HV	Cap.	Deq.	Lane	Prob.	Ov.
From W					veh/h	Stn	Util.	SL Ov.	Lane
To Exit	N	S				v/c	%	%	No.
Lane 1	21	244	265	0.8	308	0.862	100	NA	NA
Approach	21	244	265	0.8		0.862			
Total	%HV/Deg. Satn (v/c)								

All Vehicles 3760 2.5 0.862

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

Exit Lane Number	Short Lane Length (m)	Parent Lane	Opposing Lane	Opposing Flow Rate (veh/h)	Critical Cap. (sec)	Followup Headway (sec)	Lane Capacity (veh/h)	Deq. Satn (v/c)	Min. Delay (sec)	Merge Delay (sec)
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial Queued Demand (veh)	Residual Queued Demand (veh)	Time for Residual Demand to Clear (sec)	Duration of Oversatn (sec)
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South: R44

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

North: R44

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

West: Fir Street

Lane 1	0.0	0.0	0.0	0.0
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LANE SUMMARY

Site: Int1 [Int 1: R44 / Hendriske Road_PM Peak_Duel - Esc Existing + All Devs (Site Folder: 2026 PM Peak - Esc Existing+ All Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 50 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	HV %	[Total veh/h]	HV %	veh/h	v/c	%	sec		[Veh]	Dist m		m	%	%
South: R44															
Lane 1	483	0.0	483	0.0	1146	0.422	100	8.0	LOS A	3.7	25.8	Short	80	0.0	NA
Lane 2	271	3.7	271	3.7	1219	0.222	35 ⁶	7.0	LOS A	2.8	20.1	Full	500	0.0	0.0
Lane 3	762	3.7	762	3.7	1217	0.626	100	5.9	LOS A	11.3	81.6	Full	500	0.0	0.0
Approach	1516	2.5	1516	2.5		0.626		6.8	LOS A	11.3	81.6				
East: RoadName															
Lane 1	2	0.0	2	0.0	188	0.011	100	27.4	LOS C	0.0	0.3	Full	500	0.0	0.0
Approach	2	0.0	2	0.0		0.011		27.4	LOS C	0.0	0.3				
North: R44															
Lane 1	288	3.1	288	3.1	1223	0.235	100	4.1	LOS A	3.0	21.5	Full	500	0.0	0.0
Lane 2	288	3.1	288	3.1	1223	0.235	100	4.1	LOS A	3.0	21.5	Full	500	0.0	0.0
Lane 3	112	0.0	112	0.0	281	0.397	100	18.1	LOS B	2.1	14.8	Short	80	0.0	NA
Approach	687	2.6	687	2.6		0.397		6.4	LOS A	3.0	21.5				
West: Hendriske Road															
Lane 1	136	0.5	136	0.5	210	0.648	100	31.8	LOS C	3.6	25.0	Short	20	0.0	NA
Lane 2	155	0.9	155	0.9	240	0.648	100	30.8	LOS C	4.0	28.3	Full	500	0.0	0.0
Approach	292	0.7	292	0.7		0.648		31.2	LOS C	4.0	28.3				
All Vehicles	2497	2.3	2497	2.3		0.648		9.5	LOS A	11.3	81.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

⁶ Lane under-utilisation due to downstream effects

Approach Lane Flows (veh/h)

South: R44

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit:	W	N	E			veh/h	v/c	%	%	
Lane 1	483	-	-	483	0.0	1146	0.422	100	0.0	2
Lane 2	-	271	-	271	3.7	1219	0.222	35 ⁶	NA	NA
Lane 3	-	761	1	762	3.7	1217	0.626	100	NA	NA
Approach	483	1032	1	1516	2.5		0.626			

East: RoadName

Mov. From E To Exit	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1	1	2	0.0	188	0.011	100	NA	NA
Approach	1	1	2	0.0		0.011			

North: R44

Mov. From N To Exit	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1	287	-	288	3.1	1223	0.235	100	NA	NA
Lane 2	-	288	-	288	3.1	1223	0.235	100	NA	NA
Lane 3	-	-	112	112	0.0	281	0.397	100	0.0	2
Approach	1	575	112	687	2.6		0.397			

West: Hendriske Road

Mov.	L2	R2	Total	%HV		Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From W To Exit	N	S			Cap. veh/h				
Lane 1	63	73	136	0.5	210	0.648	100	25.3	2
Lane 2	-	155	155	0.9	240	0.648	100	NA	NA
Approach	63	228	292	0.7		0.648			
Total	%HV/Deg.Satn (v/c)								

All Vehicles 2497 2.3 0.648

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Opposing Flow Rate %veh/h down	Opposing Flow Rate veh/h	Griffith Gap sec	Follow-up Headway sec	Lane/Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
North Exit: R44									
Merge Type: Priority									
Exit Short Lane	1	60	0.0	794	808	3.05	2.03	302	924 0.327 1.8 3.0
Merge Lane	2	-	100.0	Merge Lane is not Opposed			794	1800 0.441 0.0 0.0	

Variable Demand Analysis

Initial Queued Demand veh	Residual Queued Demand veh	Time to Residual Demand to Clear sec	Duration of Oversatn sec
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South: R44

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

East: RoadName

Lane 1	0.0	0.0	0.0	0.0
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North: R44

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

West: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
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Lane 2	0.0	0.0	0.0	0.0
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LANE SUMMARY

Site: Int1 [Int 1: R44 / Hendriske Road_PM Peak_Duel+TurnExt

- Esc Existing + All Devs (Site Folder: 2026 PM Peak - Esc Existing+ All Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 50 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.	
	Total	HV	Total	HV						[Veh]	[Dist]			%	%
	veh/mn	%	veh/mn	%						veh/mn	ft/s			%	sec
South: R44															
Lane 1	483	0.0	483	0.0	1146	0.422	100	8.0	LOS A	3.7	25.8	Short	80	0.0	NA
Lane 2	271	3.7	271	3.7	1219	0.222	35 ⁶	7.0	LOS A	2.8	20.1	Full	500	0.0	0.0
Lane 3	762	3.7	762	3.7	1217	0.626	100	5.9	LOS A	11.3	81.6	Full	500	0.0	0.0
Approach	1516	2.5	1516	2.5		0.626		6.8	LOS A	11.3	81.6				
East: RoadName															
Lane 1	2	0.0	2	0.0	188	0.011	100	27.4	LOS C	0.0	0.3	Full	500	0.0	0.0
Approach	2	0.0	2	0.0		0.011		27.4	LOS C	0.0	0.3				
North: R44															
Lane 1	288	3.1	288	3.1	1223	0.235	100	4.1	LOS A	3.0	21.5	Full	500	0.0	0.0
Lane 2	288	3.1	288	3.1	1223	0.235	100	4.1	LOS A	3.0	21.5	Full	500	0.0	0.0
Lane 3	112	0.0	112	0.0	281	0.397	100	18.1	LOS B	2.1	14.8	Short	80	0.0	NA
Approach	687	2.6	687	2.6		0.397		6.4	LOS A	3.0	21.5				
West: Hendriske Road															
Lane 1	136	0.5	136	0.5	210	0.648	100	31.8	LOS C	3.6	25.0	Short	80	0.0	NA
Lane 2	155	0.9	155	0.9	240	0.648	100	30.8	LOS C	4.0	28.3	Full	500	0.0	0.0
Approach	292	0.7	292	0.7		0.648		31.2	LOS C	4.0	28.3				
All Vehicles	2497	2.3	2497	2.3		0.648		9.5	LOS A	11.3	81.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

⁶ Lane under-utilisation due to downstream effects

Approach Lane Flows (veh/h)

South: R44

Mov. From To Ext	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn	Lane Util.	Prob. Sl. Ov.	Ov. Lane No.
	W	N	E							
Lane 1	483	-	-	483	0.0	1146	0.422	100	0.0	2
Lane 2	-	271	-	271	3.7	1219	0.222	35 ⁶	NA	NA
Lane 3	-	761	1	762	3.7	1217	0.626	100	NA	NA
Approach	483	1032	1	1516	2.5		0.626			

East: RoadName

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From E To Exit:	S	N			veh/h	Satn v/c	Util. SL %	SL Ov. %	Lane No.
Lane 1	1	1	2	0.0	188	0.011	100	NA	NA
Approach	1	1	2	0.0		0.011			

North: R44

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From N To Exit:	E	S	W			veh/h	Satn v/c	Util. SL %	SL Ov. %	Lane No.
Lane 1	1	287	-	288	3.1	1223	0.235	100	NA	NA
Lane 2	-	288	-	288	3.1	1223	0.235	100	NA	NA
Lane 3	-	-	112	112	0.0	281	0.397	100	0.0	2
Approach	1	575	112	687	2.6		0.397			

West: Hendriske Road

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From W To Exit:	N	S			veh/h	Satn v/c	Util. SL %	SL Ov. %	Lane No.
Lane 1	63	73	136	0.5	210	0.648	100	0.0	2
Lane 2	-	155	155	0.9	240	0.648	100	NA	NA
Approach	63	228	292	0.7		0.648			

	Total	%HMD	Deg. Satn (v/c)
All Vehicles	2497	2.3	0.648

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects

Merge Analysis

Merge Analysis												
	Exit Lane Number	Short Lane Length m	Percent Oppng in Lane %	Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
North Exit: R44												
Merge Type: Priority												
Exit Short Lane	1	60	0.0	794	808	3.05	2.03	302	924	0.327	1.8	3.0
Merge Lane	2	-	100.0	Merge Lane is not Opposed				794	1800	0.441	0.0	0.0

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
East: RoadName				
Lane 1	0.0	0.0	0.0	0.0
North: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0

Lane 2	0.0	0.0	0.0	0.0
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Project: C:\Users\Armandt.VanStraten\Zutari\1001918 - Cloeteville - Documents\05 Deliver\510 Reports\2. Status Quo Analysis\Status Quo_Transport\Sidra Analysis\1001918-Cloeteville.sip9

LANE SUMMARY

Site: [Int 2: Hendriske Road / Tolbos Road_PM Peak - Esc Existing + All Devs (Site Folder: 2026 PM Peak - Esc Existing+ All Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Sain	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.	
	[Total veh/h	HV %	[Total veh/h	HV %						[Veh	Dist] m			%	%
South: Hendriske Road															
Lane 1	112	0.9	112	0.9	620	0.180	100	12.8	LOS B	0.6	4.2	Full	500	0.0	0.0
Approach	112	0.9	112	0.9		0.180		12.8	LOS B	0.6	4.2				
East: Tolbos Road															
Lane 1	55	0.0	55	0.0	436	0.126	100	14.9	LOS B	0.4	2.9	Full	500	0.0	0.0
Approach	55	0.0	55	0.0		0.126		14.9	LOS B	0.4	2.9				
North: Hendriske Road															
Lane 1	351	0.0	351	0.0	734	0.477	100	15.0	LOS C	2.1	15.0	Full	500	0.0	0.0
Approach	351	0.0	351	0.0		0.477		15.0	LOS C	2.1	15.0				
West: Tolbos Road															
Lane 1	16	0.0	16	0.0	16	1.000 ⁴	100	587.1	LOS F	4.4	31.0	Full	500	0.0	0.0
Approach	16	0.0	16	0.0		1.000		587.1	LOS F	4.4	31.0				
All Vehicles	533	0.2	533	0.2		1.000		31.5	LOS D	4.4	31.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay; Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

4 $x = 1.00$ due to minimum capacity

Approach Lane Flows (veh/h)									
South: Hendriske Road									
Mov.	T1	R2	Total	%HIV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit	N	E			veh/h	v/c	%	%	
Lane 1	103	8	112	0.9	620	0.180	100	NA	NA
Approach	103	8	112	0.9		0.180			
East: Tolbos Road									
Mov.	L2	R2	Total	%HIV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit	S	N			veh/h	v/c	%	%	
Lane 1	2	53	55	0.0	436	0.126	100	NA	NA
Approach	2	53	55	0.0		0.126			
North: Hendriske Road									
Mov.	L2	T1	R2	Total	%HIV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.
From N						veh/h	v/c	%	%

To/Exit	E	S	W		veh/h	V/C	%	%	No.
Lane 1	81	216	54	351	0.0	734	0.477	100	NA
Approach	81	216	54	351	0.0		0.477		
West: Tolbos Road									
Mov.	L2	Total	WHV			Deg. Satn	Lane Util. %	Prob. SL Ov. %	Op. Lane No.
From W To/Exit	N				Cap. veh/h	v/c			
Lane 1	16	16	0.0		16	1.000 ⁴	100	NA	NA
Approach	16	16	0.0			1.000			
Total WHV/Deg. Satn (v/c)									
All Vehicles	533	0.2		1.000					

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

⁴ x = 1.00 due to minimum capacity

Merge Analysis											
Exit Lane Number	Short Lane Length m	Percent Opposing Flow Lane	Opposing Flow Rate % veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis				
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0
East: Tolbos Road				
Lane 1	0.0	0.0	0.0	0.0
North: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0
West: Tolbos Road				
Lane 1	0.0	0.0	0.0	NA

LANE SUMMARY

Site: v [Int 2: Hendriske Road / Tolbos Road_PM Peak - Esc Existing + All Devs - Conversion (2) (Site Folder: 2026 PM Peak - Esc Existing+ All Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (Two-Way)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist] m		m	% %
South: Hendriske Road														
Lane 1	112	0.9	112	0.9	1872	0.060	100	0.6	LOS A	0.1	0.5	Full	500	0.0 0.0
Approach	112	0.9	112	0.9		0.060		0.6	NA	0.1	0.5			
East: Tolbos Road														
Lane 1	55	0.0	55	0.0	620	0.088	100	10.6	LOS B	0.3	2.1	Full	500	0.0 0.0
Approach	55	0.0	55	0.0		0.088		10.6	LOS B	0.3	2.1			
North: Hendriske Road														
Lane 1	351	0.0	351	0.0	1867	0.188	100	2.3	LOS A	0.5	3.2	Full	500	0.0 0.0
Approach	351	0.0	351	0.0		0.188		2.3	NA	0.5	3.2			
West: Tolbos Road														
Lane 1	16	0.0	16	0.0	1306	0.012	100	8.4	LOS A	0.0	0.3	Full	500	0.0 0.0
Approach	16	0.0	16	0.0		0.012		8.4	LOS A	0.0	0.3			
All Vehicles	533	0.2	533	0.2		0.188		3.0	NA	0.5	3.2			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Hendriske Road

Mov.	T1	T2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov. Lane
From S To Exit	N	E			veh/h	v/c	%	%	No.
Lane 1	103	8	112	0.9	1872	0.060	100	NA	NA
Approach	103	8	112	0.9		0.060			

East: Tolbos Road

Mov.	L2	T2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov. Lane
From E To Exit	S	N			veh/h	v/c	%	%	No.
Lane 1	2	53	55	0.0	620	0.088	100	NA	NA
Approach	2	53	55	0.0		0.088			

North: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Qv.
From N						veh/h	Satn	URL	SL Ov.	Lane
To Exit	E	S	W				v/c	%	%	No.
Lane 1	81	216	54	351	0.0	1867	0.188	100	NA	NA
Approach	81	216	54	351	0.0		0.188			

West: Tolbos Road

Mov.	L2	Total	%HV	Cap.	Deg.	Lane	Prob.	Qv.
From W To Exit	N			veh/h	Satn v/c	URL %	SL Ov. %	Lane No.
Lane 1	16	16	0.0	1306	0.012	100	NA	NA
Approach	16	16	0.0		0.012			
Total			%HV/Deg.	Satn v/c				

All Vehicles 533 0.2 0.188

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit	Short	Percent	Opposing	Initial	Follow-up	Lane	Capacity	Deg.	Min.	Merge
Lane	Lane	Opp in	Flow Rate	Gap	Headway	Flow		Satn	Delay	Delay
Number	Lane	Lane	% veh/h pcu/h	sec	sec	veh/h	veh/h	v/c	sec	sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial	Residual	Time for	Duration
Queued	Queued	Residual	of
Demand	Demand	Demand	Oversatn
veh	veh	to Clear	sec
		sec	

South: Hendriske Road

Lane 1 0.0 0.0 0.0 0.0

East: Tolbos Road

Lane 1 0.0 0.0 0.0 0.0

North: Hendriske Road

Lane 1 0.0 0.0 0.0 0.0

West: Tolbos Road

Lane 1 0.0 0.0 0.0 0.0

LANE SUMMARY

Site: v [Int 2: Hendriske Road / Tolbos Road_PM Peak - Esc
Existing + All Devs - Conversion (Site Folder: 2026 PM Peak -
Esc Existing+ All Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Give-Way (Two-Way)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Sain	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	HV %	[Total veh/h]	HV %	veh/h	v/c	%	sec		[Veh]	Dist] m		m	% %
South: Hendriske Road														
Lane 1	112	0.9	112	0.9	1872	0.060	100	0.6	LOS A	0.1	0.5	Full	500	0.0 0.0
Approach	112	0.9	112	0.9		0.060		0.6	NA	0.1	0.5			
East: Tolbos Road														
Lane 1	55	0.0	55	0.0	714	0.077	100	7.9	LOS A	0.3	1.8	Full	500	0.0 0.0
Approach	55	0.0	55	0.0		0.077		7.9	LOS A	0.3	1.8			
North: Hendriske Road														
Lane 1	351	0.0	351	0.0	1867	0.188	100	2.3	LOS A	0.5	3.2	Full	500	0.0 0.0
Approach	351	0.0	351	0.0		0.188		2.3	NA	0.5	3.2			
West: Tolbos Road														
Lane 1	16	0.0	16	0.0	1500	0.011	100	5.8	LOS A	0.0	0.3	Full	500	0.0 0.0
Approach	16	0.0	16	0.0		0.011		5.8	LOS A	0.0	0.3			
All Vehicles	533	0.2	533	0.2		0.188		2.6	NA	0.5	3.2			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Hendriske Road

Mov.	T1	R2	Total	%HV	Cap.	Deg. Sain	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit	N	E			veh/h	v/c	%	%	
Lane 1	103	8	112	0.9	1872	0.060	100	NA	NA
Approach	103	8	112	0.9		0.060			

East: Tolbos Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Sain	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit	S	N			veh/h	v/c	%	%	
Lane 1	2	53	55	0.0	714	0.077	100	NA	NA
Approach	2	53	55	0.0		0.077			

North: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From N To Exit:	E	S	W							
Lane 1	81	216	54	351	0.0	1867	0.188	100	NA	NA
Approach	81	216	54	351	0.0		0.188			

West: Tolbos Road

Mov.	L2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From W To Exit:	N							
Lane 1	16	16	0.0	1500	0.011	100	NA	NA
Approach	16	16	0.0		0.011			

	Total	%HV	Deg. Satn (v/c)
All Vehicles	533	0.2	0.188

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Opposing Flow Rate %veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
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South: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
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East: Tolbos Road

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

North: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
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West: Tolbos Road

Lane 1	0.0	0.0	0.0	0.0
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LANE SUMMARY

Site: [Int 3: Hendriske Road / Williams Road_PM Peak - Esc Existing + All Devs (Site Folder: 2026 PM Peak - Esc Existing+ All Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total	HV]	[Total	HV]						[Veh	Dist]				
	veh/h	%	veh/h	%						veh/h	v/c				
South: Williams Road															
Lane 1	34	0.0	34	0.0	337	0.100	100	17.4	LOS C	0.3	2.3	Full	500	0.0	0.0
Approach	34	0.0	34	0.0		0.100		17.4	LOS C	0.3	2.3				
East: Hendriske Road															
Lane 1	217	0.0	217	0.0	676	0.321	100	13.6	LOS B	1.2	8.4	Full	500	0.0	0.0
Approach	217	0.0	217	0.0		0.321		13.6	LOS B	1.2	8.4				
West: RoadName															
Lane 1	91	2.3	91	2.3	622	0.146	100	12.5	LOS B	0.5	3.3	Full	500	0.0	0.0
Approach	91	2.3	91	2.3		0.146		12.5	LOS B	0.5	3.3				
All Vehicles	341	0.6	341	0.6		0.321		13.7	LOS B	1.2	8.4				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)										
South: Williams Road										
Mov.	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
From S To Exit:	W	E								
Lane 1	4	29	34	0.0	337	0.100	100	NA	NA	
Approach	4	29	34	0.0		0.100				
East: Hendriske Road										
Mov.	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
From E To Exit:	S	W								
Lane 1	46	171	217	0.0	676	0.321	100	NA	NA	
Approach	46	171	217	0.0		0.321				
West: RoadName										
Mov.	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
From W To Exit:	E	S								
Lane 1	84	6	91	2.3	622	0.146	100	NA	NA	
Approach	84	6	91	2.3		0.146				

	Total	%HV	Delay (s)	Stop (s)
All Vehicles	341	0.6		0.321

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length (m)	Percent Opposing Flow Rate (% veh/h pcu/h)	Critical Gap (sec)	Follow-up Headway (sec)	Lane Capacity (veh/h)	Capacity (veh/h)	Deg. Satn	Min. Delay (sec)	Merge Delay (sec)
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial Queued Demand (veh)	Residual Queued Demand (veh)	Time for Residual Demand to Clear (sec)	Duration of Oversatn (sec)
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South: Williams Road

Lane 1	0.0	0.0	0.0	0.0
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East: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

West: RoadName

Lane 1	0.0	0.0	0.0	0.0
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Project: C:\Users\Armandt.VanStraten\Zutari\1001918 - Cloetesville - Documents\05 Deliver\510 Reports\2. Status Quo Analysis\Status Quo_Transport\Sidra Analysis\1001918-Cloetesville.sip9

LANE SUMMARY

▼ Site: 101 [Int 4: Hendriske Road / Rhode Road_PM Peak - Esc Existing + All Devs (Site Folder: 2026 PM Peak - Esc Existing+ All Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Give-Way (Two-Way)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist. m]		m	% %
South: Rhode Road														
Lane 1	21	0.0	21	0.0	1091	0.019	100	6.1	LOS A	0.1	0.5	Full	500	0.0 0.0
Approach	21	0.0	21	0.0		0.019		6.1	LOS A	0.1	0.5			
East: Hendriske Road														
Lane 1	148	0.0	148	0.0	1863	0.080	100	2.5	LOS A	0.2	1.4	Full	500	0.0 0.0
Approach	148	0.0	148	0.0		0.080		2.5	NA	0.2	1.4			
North: RoadName														
Lane 1	24	0.0	24	0.0	1053	0.023	100	6.2	LOS A	0.1	0.5	Full	500	0.0 0.0
Approach	24	0.0	24	0.0		0.023		6.2	LOS A	0.1	0.5			
West: Hendriske Road														
Lane 1	92	2.3	92	2.3	1881	0.049	100	1.7	LOS A	0.0	0.2	Full	500	0.0 0.0
Approach	92	2.3	92	2.3		0.049		1.7	NA	0.0	0.2			
All Vehicles	285	0.7	285	0.7		0.080		2.8	NA	0.2	1.4			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Rhode Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit:	W	E			veh/h	v/c	%	%	
Lane 1	8	13	21	0.0	1091	0.019	100	NA	NA
Approach	8	13	21	0.0		0.019			

East: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit:	S	W	N			veh/h	v/c	%	%	
Lane 1	39	84	25	148	0.0	1863	0.080	100	NA	NA
Approach	39	84	25	148	0.0		0.080			

North: RoadName

Mov.	L2	R2	Total	%HV	Cap.	Deq.	Lane	Prob.	Op.
From N					veh/h	sat	Util.	SL	Lane
To Exit	E	W				v/c	%	%	No.
Lane 1	7	17	24	0.0	1053	0.023	100	NA	NA
Approach	7	17	24	0.0		0.023			

West: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap.	Deq.	Lane	Prob.	Op.
From W						veh/h	sat	Util.	SL	Lane
To Exit	N	E	S				v/c	%	%	No.
Lane 1	25	63	3	92	2.3	1881	0.049	100	NA	NA
Approach	25	63	3	92	2.3		0.049			

Total	%HV	Deq.	Sat	v/c
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All Vehicles 285 0.7 0.080

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit	Short	Percent	Opposing	Critical	Followup	Lane	Capacity	Deq.	Min.	Merge
Lane	Lane	Opp in	Flow Rate	Gap	Headway	Flow	Rate	Sat	Delay	Delay
Number	Number	Lane	% veh/h pcu/h	sec	sec	veh/h	veh/h	v/c	sec	sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial	Residual	Initial	Duration
Queue	Queue	Residual	of
Demand	Demand	Demand	Oversat
veh	veh	to Clear	sec

South: Rhode Road

Lane 1 0.0 0.0 0.0 0.0

East: Hendriske Road

Lane 1 0.0 0.0 0.0 0.0

North: RoadName

Lane 1 0.0 0.0 0.0 0.0

West: Hendriske Road

Lane 1 0.0 0.0 0.0 0.0

LANE SUMMARY

Site: [Int 5: Lang Road / Gabriels Road_PM Peak - Esc Existing + All Devs (Site Folder: 2026 PM Peak - Esc Existing+ All Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	HV %	[Total veh/h]	HV %	veh/h	v/c	%	sec		[Veh]	Dist] m		m	%	%
South: Lang Road															
Lane 1	466	0.2	466	0.2	779	0.599	100	17.0	LOS C	3.3	22.9	Full	500	0.0	0.0
Approach	466	0.2	466	0.2		0.599		17.0	LOS C	3.3	22.9				
East: Gabriels Road															
Lane 1	43	0.0	43	0.0	262	0.165	100	21.9	LOS C	0.6	4.1	Full	500	0.0	0.0
Approach	43	0.0	43	0.0		0.165		21.9	LOS C	0.6	4.1				
North: Lang Road															
Lane 1	326	1.0	326	1.0	680	0.480	100	15.8	LOS C	2.2	15.4	Full	500	0.0	0.0
Approach	326	1.0	326	1.0		0.480		15.8	LOS C	2.2	15.4				
All Vehicles	836	0.5	836	0.5		0.599		16.8	LOS C	3.3	22.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Lang Road

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit	N	E			veh/h	v/c	%	%	
Lane 1	443	23	466	0.2	779	0.599	100	NA	NA
Approach	443	23	466	0.2		0.599			

East: Gabriels Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit	S	N			veh/h	v/c	%	%	
Lane 1	8	35	43	0.0	262	0.165	100	NA	NA
Approach	8	35	43	0.0		0.165			

North: Lang Road

Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From N To Exit	E	S			veh/h	v/c	%	%	
Lane 1	52	275	326	1.0	680	0.480	100	NA	NA
Approach	52	275	326	1.0		0.480			

	Total	%HV	Design Sat (V/c)
All Vehicles	836	0.5	0.599

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length (m)	Percent Origin Lane	Opposing Flow Rate (veh/h)	Critical Gap (sec)	Follow-up Headway (sec)	Lane Capacity (veh/h)	Flow Rate (veh/h)	Deg. Satn (v/c)	Min. Delay (sec)	Merge Delay (sec)
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial Queued Demand (veh)	Residual Queued Demand (veh)	Time for Residual Demand to Clear (sec)	Duration of Oversatn (sec)
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South: Lang Road

Lane 1	0.0	0.0	0.0	0.0
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East: Gabriels Road

Lane 1	0.0	0.0	0.0	0.0
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North: Lang Road

Lane 1	0.0	0.0	0.0	0.0
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LANE SUMMARY

Site: [Int 6: Welgevonden Blvd / Lang Road_PM Peak - Esc Existing + All Devs (Site Folder: 2026 PM Peak - Esc Existing+ All Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (Two-Way)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Sat'n	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist] m		m	% %
South: Lang Road														
Lane 1	372	0.0	372	0.0	1315	0.283	100	8.4	LOS A	1.4	9.9	Full	500	0.0 0.0
Approach	372	0.0	372	0.0		0.283		8.4	LOS A	1.4	9.9			
East: Welgevonden Blvd														
Lane 1	80	0.0	80	0.0	1936	0.041	100	0.8	LOS A	0.0	0.0	Full	500	0.0 0.0
Approach	80	0.0	80	0.0		0.041		0.8	NA	0.0	0.0			
West: Welgevonden Blvd														
Lane 1	352	0.0	352	0.0	1733	0.203	100	4.2	LOS A	1.1	7.6	Full	500	0.0 0.0
Approach	352	0.0	352	0.0		0.203		4.2	NA	1.1	7.6			
All Vehicles	803	0.0	803	0.0		0.283		5.8	NA	1.4	9.9			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Lang Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Sat'n	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit:	W	E			veh/h	v/c	%	%	
Lane 1	359	13	372	0.0	1315	0.283	100	NA	NA
Approach	359	13	372	0.0		0.283			

East: Welgevonden Blvd

Mov.	L2	T1	Total	%HV	Cap.	Deg. Sat'n	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit:	S	W			veh/h	v/c	%	%	
Lane 1	12	68	80	0.0	1936	0.041	100	NA	NA
Approach	12	68	80	0.0		0.041			

West: Welgevonden Blvd

Mov.	T1	R2	Total	%HV	Cap.	Deg. Sat'n	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From W To Exit:	E	S			veh/h	v/c	%	%	

Lane 1	99	253	352	0.0	1733	0.203	100	NA	NA
Approach	99	253	352	0.0		0.203			

	Total	%HV	Delay (s)	%Tol (Veh)
All Vehicles	803	0.0	0.283	

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis										
Exit Lane Number	Short Lane Length	Percent Oppg In Lane	Flow Rate	Critical Gap	Follow-up Headway	Lane Capacity Flow Rate	Deg. Satn	Min. Delay	Merge Delay	
			% veh/h pcu/h	sec	sec	veh/h	veh/h	v/c	sec	sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis				
Initial Queued Demand	Residual Demand	Time for Residual Demand to Clear	Duration of Oversatn	
veh	veh	sec	sec	

South: Lang Road

Lane 1	0.0	0.0	0.0	0.0
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East: Welgevonden Blvd

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

West: Welgevonden Blvd

Lane 1	0.0	0.0	0.0	0.0
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LANE SUMMARY

Site: Int7 [Int 7: R304 / Welgevonden Blvd_PM Peak - Esc
Existing + All Devs_Miti (Site Folder: 2026 PM Peak - Esc
Existing+ All Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist] m		m	%	%
South: R304															
Lane 1	760	2.7	760	2.7	980	0.776	100	34.4	LOS C	27.4	196.4	Full	500	0.0	0.0
Lane 2	701	2.7	701	2.7	904 ¹	0.776	100	26.3	LOS C	25.6	183.2	Short	200	0.0	NA
Lane 3	240	0.0	240	0.0	313	0.767	100	32.4	LOS C	7.4	51.9	Short	70	0.0	NA
Approach	1701	2.3	1701	2.3		0.776		30.8	LOS C	27.4	196.4				
East: Welgevonden Blvd															
Lane 1	188	0.0	188	0.0	660	0.285	100	28.0	LOS C	5.9	41.6	Short	45	0.0	NA
Lane 2	203	0.0	203	0.0	371	0.547	100	41.3	LOS D	8.2	57.6	Full	500	0.0	0.0
Approach	392	0.0	392	0.0		0.547		34.9	LOS C	8.2	57.6				
North: R304															
Lane 1	238	0.0	238	0.0	949	0.251	100	18.7	LOS B	5.8	40.6	Short	100	0.0	NA
Lane 2	608	0.5	608	0.5	993	0.613	100	16.8	LOS B	18.9	133.1	Short	200	0.0	NA
Lane 3	608	0.5	608	0.5	993	0.613	100	21.3	LOS C	18.9	133.1	Full	500	0.0	0.0
Approach	1455	0.4	1455	0.4		0.613		19.0	LOS B	18.9	133.1				
All Vehicles	3547	1.3	3547	1.3		0.776		26.4	LOS C	27.4	196.4				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)										
South: R304										
Mov. From S To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	760	-	760	2.7	980	0.776	100	NA	NA	
Lane 2	701	-	701	2.7	904 ¹	0.776	100	0.0	1	
Lane 3	-	240	240	0.0	313	0.767	100	0.0	2	
Approach	1461	240	1701	2.3		0.776				
East: Welgevonden Blvd										
Mov. From E To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	188	-	188	0.0	660	0.285	100	0.0	1	
Lane 2	203	-	203	0.0	371	0.547	100	0.0	1	
Lane 3	-	240	240	0.0	313	0.767	100	0.0	2	
Approach	392	240	632	0.0						

Lane 1	188	-	188	0.0	660	0.285	100	0.0	2
Lane 2	-	203	203	0.0	371	0.547	100	NA	NA
Approach	188	203	392	0.0		0.547			

North: R304

Mov. From N To Exit	L2 E	T1 S	Total	%HV	Cap. veh/h	Deq. Sec	Lane Util. %	Pro. St. Ov. %	Op. Lane No.
Lane 1	238	-	238	0.0	949	0.251	100	0.0	2
Lane 2	-	608	608	0.5	993	0.613	100	0.0	3
Lane 3	-	608	608	0.5	993	0.613	100	NA	NA
Approach	238	1217	1455	0.4		0.613			
Total %HV/Deg. Sat. (v/c)									

All Vehicles 3547 1.3 0.776

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Opposite Lane	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Sat. v/c	Min. Delay sec	Merge Delay sec
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South Exit: R304

Merge Type: Priority

Exit Short Lane	2	200	0.0	797	798	3.01	2.01	608	964 0.631 1.7 4.5
Merge Lane	1	-	100.0	Merge Lane is not Opposed			797	1800 0.443	0.0 0.0

North Exit: R304

Merge Type: Priority

Exit Short Lane	1	200	0.0	904	914	3.04	2.03	760	817 0.930 2.3 14.6
Merge Lane	2	-	100.0	Merge Lane is not Opposed			904	1800 0.502	0.0 0.0

Variable Demand Analysis

Initial Queue Demand veh	Residual Queue Demand veh	Time to Residual Demand to Clear sec	Duration of Oversat sec
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South: R304

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

East: Welgevonden Blvd

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

North: R304

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [Int 8: R44 / Fir Street_PMPeak - Esc Existing + All Devs - Conversion (Site Folder: 2026 PM Peak - Esc Existing+ All Devs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	HV %	[Total veh/h]	HV %	veh/h	v/c	%	sec		[Veh]	Dist m		m	%	%
South: R44															
Lane 1	920	2.9	920	2.9	1515	0.607	100	4.9	LOS A	15.5	111.0	Full	490	0.0	0.0
Lane 2	926	3.6	926	3.6	1524	0.607	100	3.7	LOS A	15.6	112.4	Full	490	0.0	0.0
Approach	1845	3.3	1845	3.3		0.607		4.3	LOS A	15.6	112.4				
North: R44															
Lane 1	699	4.1	699	4.1	1519	0.460	100	3.0	LOS A	9.6	69.3	Full	1150	0.0	0.0
Lane 2	699	4.1	699	4.1	1519	0.460	100	3.0	LOS A	9.6	69.3	Full	1150	0.0	0.0
Lane 3	19	5.6	19	5.6	125	0.151	100	14.5	LOS B	0.4	2.9	Short	60	0.0	NA
Approach	1417	4.2	1417	4.2		0.460		3.2	LOS A	9.6	69.3				
West: Fir Street															
Lane 1	72	0.0	72	0.0	124	0.578	100	53.3	LOS D	3.3	23.2	Full	260	0.0	0.0
Approach	72	0.0	72	0.0		0.578		53.3	LOS D	3.3	23.2				
All Vehicles	3334	3.6	3334	3.6		0.607		4.9	LOS A	15.6	112.4				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab). Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: R44

Mov.	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From S To Exit	W	N							
Lane 1	202	718	920	2.9	1515	0.607	100	NA	NA
Lane 2	-	926	926	3.6	1524	0.607	100	NA	NA
Approach	202	1643	1845	3.3		0.607			

North: R44

Mov.	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From N To Exit	S	W							
Lane 1	699	-	699	4.1	1519	0.460	100	NA	NA
Lane 2	699	-	699	4.1	1519	0.460	100	NA	NA
Lane 3	-	19	19	5.6	125	0.151	100	0.0	2
Approach	1398	19	1417	4.2		0.460			

West: Fir Street

Mov.	L2	R2	Total	%H/V	Gap	Deq.	Lane	Prob.	Qv.
From W					veh/h	Sec	Util.	SL	Lane
To Exit	N	S				%	%	%	No.
Lane 1	19	53	72	0.0	124	0.578	100	NA	NA
Approach	19	53	72	0.0		0.578			
Total	%H/V	Deq.	Sec	(%)					
All Vehicles	3334	3.6		0.607					

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit	Short	Percent	Opposing	Critical	Follow-up	Lane	Capacity	Deq.	Min.	Merge
Lane	Lane	Oppn	Flow Rate	Gap	Headway	Flow		Sec	Sec	Delay
Number	Length	Lane	% veh/h	sec	sec	Rate	veh/h	veh/h	%	sec
	m		% veh/h	pcu/h						

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial	Residual	Time for	Duration
	Queued	Queued	Residual	of
	Demand	Demand	Demand	Oversatn
	veh	veh	to Clear	sec
			sec	

South: R44

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

North: R44

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

West: Fir Street

Lane 1	0.0	0.0	0.0	0.0
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**Site: Int1 [Int 1: R44 / Hendriske Road_AM Peak_Duel+TurnExt
- Esc Existing + All Devs + 5 yrs (Site Folder: 2031 AM Peak -
Esc Existing + All Devs + 5 yrs)]**

New Site

Site Category: (None)

Site Category: (None)
 Signals - EQUISAT (Fixed-Time/SCATS) Isolated Delay
 Cycle Time = 70 seconds (Site Optimum Cycle Time - Minimum Delay)

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D)

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects

Approach Lane Flows (veh/h)										
South: R44										
Mov.	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SLOv.	Ov. Lane No.
From S To Exit	W	N	E			veh/m	v/c	%	%	
Lane 1	120	-	-	120	0.0	1507	0.080	100	0.0	2
Lane 2	-	211	-	211	1.4	745	0.283	35 ^B	NA	NA
Lane 3	-	590	1	591	1.4	739	0.799	100	NA	NA
Approach	120	801	1	922	1.3		0.799			
East: RoadName										

Mov. From E To Exit	L2	R2	Total	%HV	Cap. veh/h	Deq. Satn v/c	Lane Util. %	Prob. S.O. %	Qv. Lane No.
Lane 1	1	1	2	0.0	679	0.003	100	NA	NA
Approach	1	1	2	0.0		0.003			

North: R44

Mov. From N To Exit	L2	T1	R2	Total	%HV	Cap. veh/h	Deq. Satn v/c	Lane Util. %	Prob. S.O. %	Qv. Lane No.
Lane 1	1	608	-	609	1.0	747	0.816	100	NA	NA
Lane 2	-	609	-	609	1.0	747	0.816	100	NA	NA
Lane 3	-	-	39	39	0.0	151	0.257	100	0.0	2
Approach	1	1218	39	1258	1.0		0.816			

West: Hendriske Road

Mov. From W To Exit	L2	R2	Total	%HV	Cap. veh/h	Deq. Satn v/c	Lane Util. %	Prob. S.O. %	Qv. Lane No.
Lane 1	61	549	610	0.0	679	0.898	100	81.0	2
Lane 2	-	604	604	0.0	672	0.898	100	NA	NA
Approach	61	1153	1214	0.0		0.898			
Total %HV Deq Satn (v/c)									

All Vehicles 3396 0.7 0.898

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Opposite Lane %veh/h	Opposite Flow Rate veh/h	Original Gap sec	Follow-up Headway sec	Lane Capacity veh/h	Deq. Min. Satn Delay v/c sec	Merge Delay sec
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North Exit: R44

Merge Type: Priority

Exit Short Lane	1	60	0.0	621	626	3.02	2.01	242	1140	0.212	1.2	1.6
Merge Lane	2	-	100.0	Merge Lane is not Opposed				621	1800	0.345	0.0	0.0

Variable Demand Analysis

Initial Queued Demand veh	Residual Queued Demand veh	Time to Residual Demand to Clear sec	Duration of Oversatn sec
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South: R44

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

East: RoadName

Lane 1	0.0	0.0	0.0	0.0
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North: R44

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

West: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
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Lane 2	0.0	0.0	0.0	0.0
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Project: C:\Users\Armandt.VanStraten\Zutari\1001918 - Cloeterville - Documents\05 Deliver\510 Reports\2. Status Quo Analysis\Status Quo_Transport\Sidra Analysis\1001918-Cloeterville.sip9

LANE SUMMARY

Site: [Int 2: Hendriske Road / Tolbos Road_AM Peak - Esc
Existing + All Devs + 5yrs (Site Folder: 2031 AM Peak - Esc
Existing + All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back of Queue		Lane Control	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV%	Total	HV%						Queue	Dist.				
	veh/h	%	veh/h	%						veh	m				
South: Hendriske Road															
Lane 1	280	0.0	280	0.0	752	0.373	100	13.3	LOS B	1.5	10.2	Full	500	0.0	0.0
Approach	280	0.0	280	0.0		0.373		13.3	LOS B	1.5	10.2				
East: Tolbos Road															
Lane 1	118	0.0	118	0.0	609	0.194	100	12.8	LOS B	0.6	4.5	Full	500	0.0	0.0
Approach	118	0.0	118	0.0		0.194		12.8	LOS B	0.6	4.5				
North: Hendriske Road															
Lane 1	152	0.7	152	0.7	635	0.239	100	13.2	LOS B	0.8	5.8	Full	500	0.0	0.0
Approach	152	0.7	152	0.7		0.239		13.2	LOS B	0.8	5.8				
West: Tolbos Road															
Lane 1	78	0.0	78	0.0	148	0.527	100	54.7	LOS F	2.6	18.2	Full	500	0.0	0.0
Approach	78	0.0	78	0.0		0.527		54.7	LOS F	2.6	18.2				
All Vehicles	627	0.2	627	0.2		0.527		18.3	LOS C	2.6	18.2				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab). Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. Sl. Ov.	Qv. Lane No.
From To Exit	W	N	E			veh/h	veh	%	%	
Lane 1	6	272	2	280	0.0	752	0.373	100	NA	NA
Approach	6	272	2	280	0.0		0.373			

East: Tolbos Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. Sl. Ov.	Qv. Lane No.
From To Exit	S	N			veh/h	veh	%	%	
Lane 1	14	104	118	0.0	609	0.194	100	NA	NA
Approach	14	104	118	0.0		0.194			

North: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. Sl. Ov.	Qv. Lane No.
From To Exit	E	S	W			veh/h	veh	%	%	

Lane 1	52	94	6	152	0.7	635	0.239	100	NA	NA
Approach	52	94	6	152	0.7		0.239			

West: Tolbos Road

Mov.	L2	Total	%HV			Cap.	Deg.	Lane	Prob.	Ov.
From W						veh/h	Satn	Util.	SL Ov.	Lane
To Exit:	N						v/c	%	%	No.
Lane 1	78	78	0.0			148	0.527	100	NA	NA
Approach	78	78	0.0				0.527			

	Total	%HV	Deg.	Satn (v/c)
All Vehicles	627	0.2		0.527

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppng in Lane %	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0
East: Tolbos Road				
Lane 1	0.0	0.0	0.0	0.0
North: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0
West: Tolbos Road				
Lane 1	0.0	0.0	0.0	0.0

LANE SUMMARY

▽ Site: v [Int 2: Hendriske Road / Tolbos Road_AM Peak - Esc Existing + All Devs + 5yrs - Conversion (2) (Site Folder: 2031 AM Peak - Esc Existing + All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Give-Way (Two-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]						[Veh]	[Dist]				
South: Hendriske Road															
Lane 1	280	0.0	280	0.0	1944	0.144	100	0.2	LOS A	0.0	0.1	Full	500	0.0	0.0
Approach	280	0.0	280	0.0		0.144		0.2	NA	0.0	0.1				
East: Tolbos Road															
Lane 1	118	0.0	118	0.0	720	0.164	100	8.2	LOS A	0.6	4.1	Full	500	0.0	0.0
Approach	118	0.0	118	0.0		0.164		8.2	LOS A	0.6	4.1				
North: Hendriske Road															
Lane 1	152	0.7	152	0.7	1876	0.081	100	2.2	LOS A	0.1	0.5	Full	500	0.0	0.0
Approach	152	0.7	152	0.7		0.081		2.2	NA	0.1	0.5				
West: Tolbos Road															
Lane 1	78	0.0	78	0.0	1283	0.061	100	6.4	LOS A	0.2	1.7	Full	500	0.0	0.0
Approach	78	0.0	78	0.0		0.061		6.4	LOS A	0.2	1.7				
All Vehicles	627	0.2	627	0.2		0.164		3.0	NA	0.6	4.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Hendriske Road										
Mov.	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn %	Lane Util. %	Prob. St. Ov. %	Ov. Lane No.
From S To Exit	W	N	E							
Lane 1	6	272	2	280	0.0	1944	0.144	100	NA	NA
Approach	6	272	2	280	0.0		0.144			
East: Tolbos Road										
Mov.	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn %	Lane Util. %	Prob. St. Ov. %	Ov. Lane No.	
From E To Exit	S	N								
Lane 1	14	104	118	0.0	720	0.164	100	NA	NA	
Approach	14	104	118	0.0		0.164				

North: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From N						veh/h	Satn	Util.	SL Ov.	Lane
To Exit:	E	S	W				v/c	%	%	No.
Lane 1	52	94	6	152	0.7	1876	0.081	100	NA	NA
Approach	52	94	6	152	0.7		0.081			

West: Tolbos Road

Mov.	L2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From W				veh/h	Satn	Util.	SL Ov.	Lane
To Exit:	N				v/c	%	%	No.
Lane 1	78	78	0.0	1283	0.061	100	NA	NA
Approach	78	78	0.0		0.061			

Total	%HV	Deg.	Satn (v/c)
All Vehicles	627	0.2	0.164

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppng in Flow Rate % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0
East: Tolbos Road				
Lane 1	0.0	0.0	0.0	0.0
North: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0
West: Tolbos Road				
Lane 1	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: v [Int 2: Hendriske Road / Tolbos Road_AM Peak - Esc Existing + All Devs + 5yrs - Conversion (Site Folder: 2031 AM Peak - Esc Existing + All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (Two-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deq. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back of Queue	Back of Queue	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total Veh/h	HV %	Total Veh/h	HV %	veh/h	v/c	%	sec		[Veh]	[Dist] m		m	%	%
South: Hendriske Road															
Lane 1	280	0.0	280	0.0	1944	0.144	100	0.2	LOS A	0.0	0.1	Full	500	0.0	0.0
Approach	280	0.0	280	0.0		0.144		0.2	NA	0.0	0.1				
East: Tolbos Road															
Lane 1	118	0.0	118	0.0	623	0.189	100	11.0	LOS B	0.7	4.8	Full	500	0.0	0.0
Approach	118	0.0	118	0.0		0.189		11.0	LOS B	0.7	4.8				
North: Hendriske Road															
Lane 1	152	0.7	152	0.7	1876	0.081	100	2.2	LOS A	0.1	0.5	Full	500	0.0	0.0
Approach	152	0.7	152	0.7		0.081		2.2	NA	0.1	0.5				
West: Tolbos Road															
Lane 1	78	0.0	78	0.0	1095	0.071	100	9.2	LOS A	0.3	2.0	Full	500	0.0	0.0
Approach	78	0.0	78	0.0		0.071		9.2	LOS A	0.3	2.0				
All Vehicles	627	0.2	627	0.2		0.189		3.8	NA	0.7	4.8				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Hendriske Road											
Mov.	L2	T1	R2	Total	%HV	Cap.	Deq.	Lane	Prob.	OV.	
From/To	W	N	E			veh/h	v/c	Util. %	SL OV %	Lane No.	
Lane 1	6	272	2	280	0.0	1944	0.144	100	NA	NA	
Approach	6	272	2	280	0.0		0.144				
East: Tolbos Road											
Mov.	L2	R2	Total	%HV	Cap.	Deq.	Lane	Prob.	OV.		
From/To	S	N			veh/h	v/c	Util. %	SL OV %	Lane No.		
Lane 1	14	104	118	0.0	623	0.189	100	NA	NA		
Approach	14	104	118	0.0		0.189					

North: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Qv.
From N						veh/h	Satn	Util.	SL	Lane
To Exit:	E	S	W				v/c	%	%	No.
Lane 1	52	94	6	152	0.7	1876	0.081	100	NA	NA
Approach	52	94	6	152	0.7		0.081			

West: Tolbos Road

Mov.	L2	Total	%HV	Cap.	Deg.	Lane	Prob.	Qv.
From W				veh/h	Satn	Util.	SL	Lane
To Exit:	N				v/c	%	%	No.
Lane 1	78	78	0.0	1095	0.071	100	NA	NA
Approach	78	78	0.0		0.071			

Total	%HV	Deg.	Satn	(v/c)
All Vehicles	627	0.2		0.189

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit	Short	Percent	Opposing	Critical	Follow-up	Lane	Capacity	Deg.	Min.	Merge
Lane	Lane	Oppng in	Flow Rate	Cap	Headway	Flow		Satn	Delay	Delay
Number	Length	Lane	%veh/h	sec	sec	veh/h	veh/h	v/c	sec	sec
	m									

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial	Residual	Time for	Duration
Queued	Queued	Residual	of
Demand	Demand	Demand	Oversatn
veh	veh	to Clear	sec
		sec	

South: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
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East: Tolbos Road

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

North: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

West: Tolbos Road

Lane 1	0.0	0.0	0.0	0.0
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LANE SUMMARY

Site: [Int 3: Hendriske Road / Williams Road_AM Peak - Esc
Existing + All Devs + 5yrs (Site Folder: 2031 AM Peak - Esc
Existing + All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Grn/Flt	Lane Length	Cap. Adj.	Prob. Block
	Total	HV/	Total	HV/						[Veh	Dist]				
	veh/m	%	veh/m	%						veh/m	%				
South: Williams Road															
Lane 1	63	1.7	63	1.7	385	0.164	100	16.8	LOS C	0.6	4.0	Full	500	0.0	0.0
Approach	63	1.7	63	1.7		0.164		16.8	LOS C	0.6	4.0				
East: Hendriske Road															
Lane 1	107	1.0	107	1.0	529	0.203	100	14.3	LOS B	0.7	4.9	Full	500	0.0	0.0
Approach	107	1.0	107	1.0		0.203		14.3	LOS B	0.7	4.9				
West: RoadName															
Lane 1	229	0.0	229	0.0	700	0.328	100	13.3	LOS B	1.2	8.6	Full	500	0.0	0.0
Approach	229	0.0	229	0.0		0.328		13.3	LOS B	1.2	8.6				
All Vehicles	400	0.5	400	0.5		0.328		14.1	LOS B	1.2	8.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)										
South: Williams Road										
Mov.	L2	R2	Total	%HV	Cap. veh/m	Deg. Satn v/c	Lane Util. %	Prob. Sl. Ov. %	Ov. Lane No.	
From S To Exit	W	E								
Lane 1	7	56	63	1.7	385	0.164	100	NA	NA	
Approach	7	56	63	1.7		0.164				
East: Hendriske Road										
Mov.	L2	T1	Total	%HV	Cap. veh/m	Deg. Satn v/c	Lane Util. %	Prob. Sl. Ov. %	Ov. Lane No.	
From E To Exit	S	W								
Lane 1	38	69	107	1.0	529	0.203	100	NA	NA	
Approach	38	69	107	1.0		0.203				
West: RoadName										
Mov.	T1	R2	Total	%HV	Cap. veh/m	Deg. Satn v/c	Lane Util. %	Prob. Sl. Ov. %	Ov. Lane No.	
From W To Exit	E	S								
Lane 1	224	5	229	0.0	700	0.328	100	NA	NA	
Approach	224	5	229	0.0		0.328				

	Total	%HV	Deg. Sat	Service (v/c)
All Vehicles	400	0.5		0.328

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis										
Exit Lane Number	Short Lane Length m	Percent Oppg in Lane	Opposing Flow Rate %veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Sat v/c	Min. Sain Delay sec	Merge Delay sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis				
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec

South: Williams Road

Lane 1	0.0	0.0	0.0	0.0
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East: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
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West: RoadName

Lane 1	0.0	0.0	0.0	0.0
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LANE SUMMARY

▽ Site: 101 [Int 4: Hendriske Road / Rhode Road_AM Peak - Esc
Existing + All Devs + 5yrs (Site Folder: 2031 AM Peak - Esc
Existing + All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Give-Way (Two-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV% %	Total veh/h	HV% %	veh/h	v/c	%	sec		[Veh	Dist] m		m	%	%
South: Rhode Road															
Lane 1	24	0.0	24	0.0	1081	0.022	100	6.2	LOS A	0.1	0.5	Full	500	0.0	0.0
Approach	24	0.0	24	0.0		0.022		6.2	LOS A	0.1	0.5				
East: Hendriske Road															
Lane 1	74	0.0	74	0.0	1897	0.039	100	2.0	LOS A	0.0	0.2	Full	500	0.0	0.0
Approach	74	0.0	74	0.0		0.039		2.0	NA	0.0	0.2				
North: RoadName															
Lane 1	49	0.0	49	0.0	1175	0.042	100	6.2	LOS A	0.2	1.1	Full	500	0.0	0.0
Approach	49	0.0	49	0.0		0.042		6.2	LOS A	0.2	1.1				
West: Hendriske Road															
Lane 1	179	0.0	179	0.0	1930	0.093	100	0.8	LOS A	0.0	0.3	Full	500	0.0	0.0
Approach	179	0.0	179	0.0		0.093		0.8	NA	0.0	0.3				
All Vehicles	326	0.0	326	0.0		0.093		2.3	NA	0.2	1.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Rhode Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. Sl. Ov.	Qv. Lane No.
From S To Exit	W	E			veh/h	v/c	%	%	
Lane 1	11	14	24	0.0	1081	0.022	100	NA	NA
Approach	11	14	24	0.0		0.022			

East: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. Sl. Ov.	Qv. Lane No.
From E To Exit	S	W	N			veh/h	v/c	%	%	
Lane 1	22	48	3	74	0.0	1897	0.039	100	NA	NA
Approach	22	48	3	74	0.0		0.039			

North: RoadName

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From N					veh/h	Satn	Util.	SL	Lane
To Exit:	E	W				v/c	%	%	No.
Lane 1	32	18	49	0.0	1175	0.042	100	NA	NA
Approach	32	18	49	0.0		0.042			

West: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From W						veh/h	Satn	Util.	SL	Lane
To Exit:	N	E	S				v/c	%	%	No.
Lane 1	21	154	4	179	0.0	1930	0.093	100	NA	NA
Approach	21	154	4	179	0.0		0.093			

Total	%HV	Deg.	Satn	v/c
All Vehicles	326	0.0		0.093

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit	Short	Percent	Opposing	Critical	Follow-up	Lane Capacity	Deg.	Min.	Merge
Lane	Lane	Opp in	Flow Rate	Gap	Headway	Flow	Satn	Delay	Delay
Number	Length	Lane	% veh/h pcu/h	sec	sec	veh/h	v/c	sec	sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial	Residual	Time for	Duration
	Queued	Queued	Residual	of
	Demand	Demand	Demand	Oversatn
	veh	veh	to Clear	sec
			sec	
South: Rhode Road				
Lane 1	0.0	0.0	0.0	0.0
East: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0
North: RoadName				
Lane 1	0.0	0.0	0.0	0.0
West: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: [Int 5: Lang Road / Gabriels Road_AM Peak - Esc
Existing + All Devs + 5yrs (Site Folder: 2031 AM Peak - Esc
Existing + All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back of Queue		Lane Grnffe	Lane Length	Gap Adj.	Prob. Block.
	Total	HV%	Total	HV%						[Veh	Dist]				
	veh/h	%	veh/h	%						veh/h	m				
South: Lang Road															
Lane 1	382	0.0	382	0.0	822	0.465	100	13.8	LOS B	2.0	14.1	Full	500	0.0	0.0
Approach	382	0.0	382	0.0		0.465		13.8	LOS B	2.0	14.1				
East: Gabriels Road															
Lane 1	83	0.0	83	0.0	266	0.312	100	25.2	LOS D	1.2	8.7	Full	500	0.0	0.0
Approach	83	0.0	83	0.0		0.312		25.2	LOS D	1.2	8.7				
North: Lang Road															
Lane 1	986	0.5	986	0.5	928	1.062	100	102.0	LOS F	41.7	293.3	Full	500	0.0	0.0
Approach	986	0.5	986	0.5		1.062		102.0	LOS F	41.7	293.3				
All Vehicles	1452	0.4	1452	0.4		1.062		74.4	LOS F	41.7	293.3				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay; Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Lang Road										
Mov.	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn %	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
From S To Exit	N	E								
Lane 1	374	8	382	0.0	822	0.465	100	NA	NA	
Approach	374	8	382	0.0		0.465				
East: Gabriels Road										
Mov.	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn %	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
From E To Exit	S	N								
Lane 1	38	45	83	0.0	266	0.312	100	NA	NA	
Approach	38	45	83	0.0		0.312				
North: Lang Road										
Mov.	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn %	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
From N To Exit	E	S								
Lane 1	49	937	986	0.5	928	1.062	100	NA	NA	
Approach	49	937	986	0.5		1.062				

	Total	%HV	Deg. Satn (v/c)
All Vehicles	1452	0.4	1.062

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis									
Exit Lane Number	Short Lane Length m	Percent Oppng in Lane %veh/h	Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis				
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Lang Road				
Lane 1	0.0	0.0	0.0	0.0
East: Gabriels Road				
Lane 1	0.0	0.0	0.0	0.0
North: Lang Road				
Lane 1	0.0	29.0	112.5	NA

LANE SUMMARY

**Site: v [Int 5: Lang Road / Gabriels Road_AM Peak - Esc
Existing + All Devs + 5yrs - Conversion (2) (Site Folder: 2031 AM
Peak - Esc Existing + All Devs + 5 yrs)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (Two-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total Veh/h]	[HV %]	[Total Veh/h]	[HV %]						[Veh]	[Dist. m]				
	veh/h	%	veh/h	%						veh/h	v/c				
South: Lang Road															
Lane 1	382	0.0	382	0.0	1827	0.209	100	0.7	LOS A	0.2	1.6	Full	500	0.0	0.0
Approach	382	0.0	382	0.0		0.209		0.7	NA	0.2	1.6				
East: Gabriels Road															
Lane 1	83	0.0	83	0.0	209	0.399	100	28.0	LOS D	1.4	9.6	Full	500	0.0	0.0
Approach	83	0.0	83	0.0		0.399		28.0	LOS D	1.4	9.6				
North: Lang Road															
Lane 1	986	0.5	986	0.5	1938	0.509	100	0.5	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	986	0.5	986	0.5		0.509		0.5	NA	0.0	0.0				
All Vehicles	1452	0.4	1452	0.4		0.509		2.1	NA	1.4	9.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Lang Road

Mov.	LT	RT	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. St. Ov.	Qv. Lane No.
From S To Exit	N	E			veh/h	%	%	%	
Lane 1	374	8	382	0.0	1827	0.209	100	NA	NA
Approach	374	8	382	0.0		0.209			

East: Gabriels Road

Mov.	LT	RT	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. St. Ov.	Qv. Lane No.
From E To Exit	S	N			veh/h	%	%	%	
Lane 1	38	45	83	0.0	209	0.399	100	NA	NA
Approach	38	45	83	0.0		0.399			

North: Lang Road

Mov.	LT	RT	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. St. Ov.	Qv. Lane No.
From N To Exit	E	S			veh/h	%	%	%	

Lane 1	49	937	986	0.5	1938	0.509	100	NA	NA
Approach	49	937	986	0.5		0.509			

Total %HVDeg.Satn (v/c)

All Vehicles 1452 0.4 0.509

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppng in Lane %veh/h	Oposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Lang Road				
Lane 1	0.0	0.0	0.0	0.0
East: Gabriels Road				
Lane 1	0.0	0.0	0.0	0.0
North: Lang Road				
Lane 1	0.0	0.0	0.0	0.0

LANE SUMMARY

▽ Site: v [Int 5: Lang Road / Gabriels Road_AM Peak - Esc
Existing + All Devs + 5yrs - Conversion (Site Folder: 2031 AM
Peak - Esc Existing + All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Give-Way (Two-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block
	Total	HV%	Total	HV%						[Veh	Dist				
	veh/hr	%	veh/hr	%						veh/hr	%				
South: Lang Road															
Lane 1	382	0.0	382	0.0	1827	0.209	100	0.7	LOS A	0.2	1.6	Full	500	0.0	0.0
Approach	382	0.0	382	0.0		0.209		0.7	NA	0.2	1.6				
East: Gabriels Road															
Lane 1	83	0.0	83	0.0	291	0.286	100	18.4	LOS C	1.0	6.7	Full	500	0.0	0.0
Approach	83	0.0	83	0.0		0.286		18.4	LOS C	1.0	6.7				
North: Lang Road															
Lane 1	986	0.5	986	0.5	1938	0.509	100	0.5	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	986	0.5	986	0.5		0.509		0.5	NA	0.0	0.0				
All Vehicles	1452	0.4	1452	0.4		0.509		1.6	NA	1.0	6.7				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)									
South: Lang Road									
Mov.	T	R	Total	%HV		Disc.	Lane	Progn.	OV
From S To Exit	N	E			Grp.	Stall	Util.	S. Ov.	Lane No.
Lane 1	374	8	382	0.0	1827	0.209	100	NA	NA
Approach	374	8	382	0.0	0.209				
East: Gabriels Road									
Mov.	L	R	Total	%HV		Disc.	Lane	Progn.	OV
From E To Exit	W	N			Grp.	Stall	Util.	S. Ov.	Lane No.
Lane 1	38	45	83	0.0	291	0.286	100	NA	NA
Approach	38	45	83	0.0	0.286				
North: Lang Road									
Mov.	L	T	Total	%HV		Disc.	Lane	Progn.	OV
From N To Exit	E	S			Grp.	Stall	Util.	S. Ov.	Lane No.

Lane 1	49	937	986	0.5	1938	0.509	100	NA	NA
Approach	49	937	986	0.5		0.509			

Total	%HV	Deg Satn (v/c)	
All Vehicles	1452	0.4	0.509

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis										
Exit Lane Number	Short Lane Length m	Percent Oppng in Lane	Flow Rate %veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis				
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Lang Road				
Lane 1	0.0	0.0	0.0	0.0
East: Gabriels Road				
Lane 1	0.0	0.0	0.0	0.0
North: Lang Road				
Lane 1	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: [Int 6: Welgevonden Blvd / Lang Road_AM Peak - Esc
Existing + All Devs + 5yrs (Site Folder: 2031 AM Peak - Esc
Existing + All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (Two-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Control	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist. m]		m	%	%
South: Lang Road															
Lane 1	279	0.8	279	0.8	1128	0.247	100	9.1	LOS A	1.1	7.9	Full	500	0.0	0.0
Approach	279	0.8	279	0.8		0.247		9.1	LOS A	1.1	7.9				
East: Welgevonden Blvd															
Lane 1	136	0.0	136	0.0	1938	0.070	100	0.7	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	136	0.0	136	0.0		0.070		0.7	NA	0.0	0.0				
West: Welgevonden Blvd															
Lane 1	797	1.1	797	1.1	1601	0.498	100	5.9	LOS A	3.5	25.1	Full	500	0.0	0.0
Approach	797	1.1	797	1.1		0.498		5.9	NA	3.5	25.1				
All Vehicles	1212	0.9	1212	0.9		0.498		6.1	NA	3.5	25.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Lang Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. Sl. Ov.	Qv.
From/To	W	E			veh/h	v/c	%	%	Lane No.
Lane 1	271	8	279	0.8	1128	0.247	100	NA	NA
Approach	271	8	279	0.8		0.247			

East: Welgevonden Blvd

Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. Sl. Ov.	Qv.
From/To	S	W			veh/h	v/c	%	%	Lane No.
Lane 1	17	119	136	0.0	1938	0.070	100	NA	NA
Approach	17	119	136	0.0		0.070			

West: Welgevonden Blvd

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. Sl. Ov.	Qv.
From/To	E	S			veh/h	v/c	%	%	Lane No.

Lane 1	46	751	797	1.1	1601	0.498	100	NA	NA
Approach	46	751	797	1.1		0.498			

Total	%HV/Deg. Satn (v/c)
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All Vehicles	1212	0.9	0.498
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Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppng in Lane	Flow Rate %veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
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South: Lang Road

Lane 1	0.0	0.0	0.0	0.0
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East: Welgevonden Blvd

Lane 1	0.0	0.0	0.0	0.0
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West: Welgevonden Blvd

Lane 1	0.0	0.0	0.0	0.0
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LANE SUMMARY

**Site: Int7 [Int 7: R304 / Welgevonden Blvd_AM Peak - Esc
Existing + All Devs + 5 yrs_Miti (Site Folder: 2031 AM Peak - Esc
Existing + All Devs + 5 yrs)]**

Output produced by **SIDRA INTERSECTION Version: 9.1.6.228**

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block
	[Total]	[HV]	[Total]	[HV]						[Veh]	[Dist.]				
	veh/h	%	veh/h	%						veh/h	u/c				
South: R304															
Lane 1	783	1.6	783	1.6	922	0.849	100	79.7	LOS E	33.7	239.1	Full	500	0.0	0.0
Lane 2	696	1.6	696	1.6	819 ¹	0.849	100	35.8	LOS D	30.5	216.1	Short	200	0.0	NA
Lane 3	316	0.0	316	0.0	320	0.986	100	83.6	LOS F	16.9	118.2	Short	70	0.0	NA
Approach	1795	1.3	1795	1.3		0.986		63.4	LOS E	33.7	239.1				
East: Welgevonden Blvd															
Lane 1	231	0.0	231	0.0	722	0.319	100	26.9	LOS C	7.1	49.4	Short	45	0.0	NA
Lane 2	279	0.0	279	0.0	359 ¹	0.776	100	47.0	LOS D	12.6	88.3	Full	500	0.0	0.0
Approach	509	0.0	509	0.0		0.776		37.9	LOS D	12.6	88.3				
North: R304															
Lane 1	400	0.5	400	0.5	884	0.452	100	24.9	LOS C	11.7	82.0	Short	100	0.0	NA
Lane 2	745	2.5	745	2.5	836 ¹	0.891	100	37.2	LOS D	36.1	258.4	Short	200	0.0	NA
Lane 3	817	2.5	817	2.5	917	0.891	100	137.3	LOS F	39.0	279.1	Full	500	0.0	0.0
Approach	1962	2.1	1962	2.1		0.891		76.4	LOS E	39.0	279.1				
All Vehicles	4266	1.5	4266	1.5		0.986		66.3	LOS E	39.0	279.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)

South: R304

Mov.	R1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Progn. St. Ov.	Qv. Lane No.
From To Exit	N	E			veh/h	%	%	%	
Lane 1	783	-	783	1.6	922	0.849	100	NA	NA
Lane 2	696	-	696	1.6	819 ¹	0.849	100	12.0	1
Lane 3	-	316	316	0.0	320	0.986	100	53.2	2
Approach	1479	316	1795	1.3		0.986			

East: Welgevonden Blvd

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Progn. St. Ov.	Qv. Lane No.
From To Exit	S	N			veh/h	%	%	%	

Lane 1	231	-	231	0.0	722	0.319	100	13.5	2
Lane 2	-	279	279	0.0	359 ¹	0.776	100	NA	NA
Approach	231	279	509	0.0		0.776			

North: R304

Mov. From N To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	E	S							
Lane 1	400	-	400	0.5	884	0.452	100	0.0	2
Lane 2	-	745	745	2.5	836 ¹	0.891	100	28.3	3
Lane 3	-	817	817	2.5	917	0.891	100	NA	NA
Approach	400	1562	1962	2.1		0.891			
Total %HV Deg. Satn (v/c)									

All Vehicles 4266 1.5 0.986

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppg in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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South Exit: R304

Merge Type: Priority

Exit Short Lane	2	200	0.0	976	985	3.04	2.02	817	743 1.100	2.7	103.8
Merge Lane	1	-	100.0	Merge Lane is not Opposed				976	1800 0.542	0.0	0.0

North Exit: R304

Merge Type: Priority

Exit Short Lane	1	200	0.0	975	980	3.02	2.02	783	758 1.033	2.6	51.9
Merge Lane	2	-	100.0	Merge Lane is not Opposed				975	1800 0.541	0.0	0.0

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
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South: R304

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

East: Welgevonden Blvd

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

North: R304

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [Int 8: R44 / Fir Street_AMPeak - Esc Existing + All Devs + 5 yrs - Conversion (Site Folder: 2031 AM Peak - Esc Existing + All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]						[Veh]	[Dist m]				
South: R44															
Lane 1	658	3.6	658	3.6	1391	0.473	100	7.4	LOS A	15.4	111.1	Full	490	0.0	0.0
Lane 2	660	3.9	660	3.9	1394	0.473	100	6.9	LOS A	15.4	111.6	Full	490	0.0	0.0
Approach	1318	3.8	1318	3.8		0.473		7.1	LOS A	15.4	111.6				
North: R44															
Lane 1	1361	2.1	1361	2.1	1411	0.965	100	37.9	LOS D	90.9	648.0	Full	1150	0.0	0.0
Lane 2	1096	2.1	1096	2.1	1136	0.965	100	53.8	LOS D	77.4	551.7	Full	1150	0.0	0.0
Lane 3	64	0.0	64	0.0	204	0.315	100	28.6	LOS C	2.0	13.9	Short	60	0.0	NA
Approach	2521	2.0	2521	2.0		0.965		44.6	LOS D	90.9	648.0				
West: Fir Street															
Lane 1	293	0.7	293	0.7	308	0.950	100	82.8	LOS F	21.4	150.6	Full	260	0.0	0.0
Approach	293	0.7	293	0.7		0.950		82.8	LOS F	21.4	150.6				
All Vehicles	4132	2.5	4132	2.5		0.965		35.3	LOS D	90.9	648.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab). Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)

South: R44

Mov.	T2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Progn. Sl. Ov.	Qv. Lane No.
From To Exit	W	N			veh/h	%	%	%	
Lane 1	62	596	658	3.6	1391	0.473	100	NA	NA
Lane 2	-	660	660	3.9	1394	0.473	100	NA	NA
Approach	62	1256	1318	3.8		0.473			

North: R44

Mov.	T1	T2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Progn. Sl. Ov.	Qv. Lane No.
From To Exit	S	W			veh/h	%	%	%	
Lane 1	1361	-	1361	2.1	1411	0.965	100	NA	NA
Lane 2	1096	-	1096	2.1	1136 ¹	0.965	100	NA	NA
Lane 3	-	64	64	0.0	204	0.315	100	0.0	2

Approach 2457 64 2521 2.0 0.965

West: Fir Street

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Qv.
From W To Exit	N	S			veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	23	269	293	0.7	308	0.950	100	NA	NA
Approach	23	269	293	0.7		0.950			
Total %HV Deg. Satn (v/c)									
All Vehicles	4132	2.5		0.965					

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppng in Lane %	Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Fir Street				
Lane 1	0.0	0.0	0.0	0.0

LANE SUMMARY

**Site: Int1 [Int 1: R44 / Hendriske Road_PM Peak_Duel+TurnExt
- Esc Existing + All Devs + 5 yrs (Site Folder: 2031 PM Peak -
Esc Existing+ All Devs + 5 yrs)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Delay Cycle Time = 50 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Prob. of Queue		Lane Count	Lane Length	Cap. Adj.	Prob. Block.
	Total Veh/m	HV/M %	Total Veh/m	HV/M %						[Veh]	[Dist] m				
South: R44															
Lane 1	525	0.0	525	0.0	1117	0.470	100	8.5	LOS A	4.5	31.7	Short	80	0.0	NA
Lane 2	295	3.7	295	3.7	1219	0.242	35 ⁶	7.8	LOS A	3.1	22.2	Full	500	0.0	0.0
Lane 3	830	3.6	830	3.6	1217	0.682	100	6.3	LOS A	13.1	94.6	Full	500	0.0	0.0
Approach	1651	2.5	1651	2.5		0.682		7.3	LOS A	13.1	94.6				
East: RoadName															
Lane 1	2	0.0	2	0.0	186	0.011	100	27.4	LOS C	0.0	0.3	Full	500	0.0	0.0
Approach	2	0.0	2	0.0		0.011		27.4	LOS C	0.0	0.3				
North: R44															
Lane 1	315	3.2	315	3.2	1223	0.257	100	4.2	LOS A	3.3	23.9	Full	500	0.0	0.0
Lane 2	315	3.2	315	3.2	1223	0.257	100	4.2	LOS A	3.3	23.9	Full	500	0.0	0.0
Lane 3	120	0.0	120	0.0	249	0.482	100	19.5	LOS B	2.4	17.1	Short	80	0.0	NA
Approach	749	2.7	749	2.7		0.482		6.6	LOS A	3.3	23.9				
West: Hendriske Road															
Lane 1	148	0.5	148	0.5	210	0.707	100	32.7	LOS C	4.0	27.9	Short	80	0.0	NA
Lane 2	169	0.8	169	0.8	240	0.707	100	31.5	LOS C	4.5	31.6	Full	500	0.0	0.0
Approach	318	0.7	318	0.7		0.707		32.1	LOS C	4.5	31.6				
All Vehicles	2720	2.3	2720	2.3		0.707		10.0	LOS B	13.1	94.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects

Approach Lane Flows (veh/h)

South: R44

Flow	L2	T1	S2	Total	WHV	Cap. Util.	Deq. Svc	Lane Util.	Prod. SLO	OV. Lane
From S to Exit	W	N	E			%/min	%	%	%	No.
Lane 1	525	-	-	525	0.0	1117	0.470	100	0.0	2
Lane 2	-	295	-	295	3.7	1219	0.242	35 ⁶	NA	NA
Lane 3	-	829	1	830	3.6	1217	0.682	100	NA	NA
Approach	525	1124	1	1651	2.5		0.682			

East: RoadName

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From E To Exit:	S	N			veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	1	1	2	0.0	186	0.011	100	NA	NA
Approach	1	1	2	0.0		0.011			

North: R44

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From N To Exit:	E	S	W			veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	1	314	-	315	3.2	1223	0.257	100	NA	NA
Lane 2	-	315	-	315	3.2	1223	0.257	100	NA	NA
Lane 3	-	-	120	120	0.0	249	0.482	100	0.0	2
Approach	1	628	120	749	2.7		0.482			

West: Hendriske Road

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From W To Exit:	N	S			veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	68	80	148	0.5	210	0.707	100	0.0	2
Lane 2	-	169	169	0.8	240	0.707	100	NA	NA
Approach	68	249	318	0.7		0.707			

Total %HV/Deg. Satn (v/c)

All Vehicles 2720 2.3 0.707

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppng in Flow Rate % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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North Exit: R44

Merge Type: Priority

Exit Short Lane	1	60	0.0	865	880	3.05	2.03	329	847	0.389	2.1	3.7
Merge Lane	2	-	100.0	Merge Lane is not Opposed			865	1800	0.480	0.0	0.0	

Variable Demand Analysis

Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
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South: R44

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

East: RoadName

Lane 1	0.0	0.0	0.0	0.0
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North: R44

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

West: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
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Lane 2	0.0	0.0	0.0	0.0
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LANE SUMMARY

Site: [Int 2: Hendriske Road / Tolbos Road_PM Peak - Esc Existing + All Devs + 5yrs (Site Folder: 2031 PM Peak - Esc Existing+ All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist] m		m	%	%
South: Hendriske Road															
Lane 1	121	0.9	121	0.9	614	0.197	100	13.0	LOS B	0.7	4.7	Full	500	0.0	0.0
Approach	121	0.9	121	0.9		0.197		13.0	LOS B	0.7	4.7				
East: Tolbos Road															
Lane 1	60	0.0	60	0.0	440	0.136	100	14.9	LOS B	0.5	3.2	Full	500	0.0	0.0
Approach	60	0.0	60	0.0		0.136		14.9	LOS B	0.5	3.2				
North: Hendriske Road															
Lane 1	377	0.0	377	0.0	725	0.520	100	15.9	LOS C	2.5	17.4	Full	500	0.0	0.0
Approach	377	0.0	377	0.0		0.520		15.9	LOS C	2.5	17.4				
West: Tolbos Road															
Lane 1	16	0.0	16	0.0	16	1.000 ⁴	100	587.1	LOS F	4.4	31.0	Full	500	0.0	0.0
Approach	16	0.0	16	0.0		1.000		587.1	LOS F	4.4	31.0				
All Vehicles	574	0.2	574	0.2		1.000		30.9	LOS D	4.4	31.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

4 $x = 1.00$ due to minimum capacity

Approach Lane Flows (veh/h)					
South: Hendriske Road					
Mov.	T1	R2	Total	%HV	
From S To Exit:	N	E			
Lane 1	113	8	121	0.9	614
Approach	113	8	121	0.9	0.197
East: Tolbos Road					
Mov.	L2	R2	Total	%HV	
From E To Exit:	S	N			
Lane 1	2	58	60	0.0	440
Approach	2	58	60	0.0	0.136
North: Hendriske Road					
Mov.	L2	T1	R2	Total	%HV
From N					

To Exit	E	S	W			veh/h	v/c	%	%	No.
Lane 1	89	233	55	377	0.0	725	0.520	100	NA	NA
Approach	89	233	55	377	0.0	0.520				
West: Tolbos Road										
From	L2	Total	W/HV			Cap.	Deq.	Lane	Pro.	Op.
To Exit	N					veh/h	Stain	Util	St.	Lane-
							v/c	%	%	No.
Lane 1	16	16	0.0			16	1.000 ⁴	100	NA	NA
Approach	16	16	0.0			1.000				
		Total	W/HV		Deq.	Stain	(v/c)			
All Vehicles	574	0.2	1.000							

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

⁴ x = 1.00 due to minimum capacity

Merge Analysis

Exit Lane Number	Station Lane	Preceding Opposing Lane	Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Capacity	Deq. Min. Stain Delay	Merge Delay
			veh/h	sec	sec	veh/h	v/c	sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial Queue Demand	Residual Queue Demand	Time for Residual Demand to Clear	Duration of Oversat
veh	veh	sec	sec

South: Hendriske Road

Lane 1 0.0 0.0 0.0 0.0

East: Tolbos Road

Lane 1 0.0 0.0 0.0 0.0

North: Hendriske Road

Lane 1 0.0 0.0 0.0 0.0

West: Tolbos Road

Lane 1 0.0 0.0 0.0 NA

LANE SUMMARY

Site: v [Int 2: Hendriske Road / Tolbos Road_PM Peak - Esc
Existing + All Devs + 5yrs - Conversion (2) (Site Folder: 2031 PM
Peak - Esc Existing+ All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Give-Way (Two-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h	HV %	[Total veh/h	HV %	veh/h	v/c	%	sec		[Veh	Dist.] m		m	%	%
South: Hendriske Road															
Lane 1	121	0.9	121	0.9	1873	0.065	100	0.6	LOS A	0.1	0.5	Full	500	0.0	0.0
Approach	121	0.9	121	0.9		0.065		0.6	NA	0.1	0.5				
East: Tolbos Road															
Lane 1	60	0.0	60	0.0	686	0.088	100	8.2	LOS A	0.3	2.0	Full	500	0.0	0.0
Approach	60	0.0	60	0.0		0.088		8.2	LOS A	0.3	2.0				
North: Hendriske Road															
Lane 1	377	0.0	377	0.0	1867	0.202	100	2.3	LOS A	0.5	3.4	Full	500	0.0	0.0
Approach	377	0.0	377	0.0		0.202		2.3	NA	0.5	3.4				
West: Tolbos Road															
Lane 1	16	0.0	16	0.0	1488	0.011	100	5.8	LOS A	0.0	0.3	Full	500	0.0	0.0
Approach	16	0.0	16	0.0		0.011		5.8	LOS A	0.0	0.3				
All Vehicles	574	0.2	574	0.2		0.202		2.6	NA	0.5	3.4				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Hendriske Road

Mov.	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From S To Exit	N	E							
Lane 1	113	8	121	0.9	1873	0.065	100	NA	NA
Approach	113	8	121	0.9		0.065			

East: Tolbos Road

Mov.	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From E To Exit	S	N							
Lane 1	2	58	60	0.0	686	0.088	100	NA	NA
Approach	2	58	60	0.0		0.088			

North: Hendriske Road

Mov. From N To Exit	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	89	233	55	377	0.0	1867	0.202	100	NA	NA
Approach	89	233	55	377	0.0		0.202			

West: Tolbos Road

Mov. From W To Exit	L2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	16	16	0.0	1488	0.011	100	NA	NA
Approach	16	16	0.0		0.011			

Total	%HV	Deg. Satn (v/c)
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All Vehicles 574 0.2 0.202

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Station Lane Length m	Parent Origin Lane	Opposing Flow Rate %veh/h per/h	Critical Gap sec	Following Headway sec	Lane Capacity Flow Rate veh/h	Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial Queue Demand veh	Residual Queue Demand veh	Time to Residual Demand sec	Direction of Over-satn sec
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South: Hendriske Road

Lane 1 0.0 0.0 0.0 0.0

East: Tolbos Road

Lane 1 0.0 0.0 0.0 0.0

North: Hendriske Road

Lane 1 0.0 0.0 0.0 0.0

West: Tolbos Road

Lane 1 0.0 0.0 0.0 0.0

LANE SUMMARY

Site: v [Int 2: Hendriske Road / Tolbos Road_PM Peak - Esc Existing + All Devs + 5yrs - Conversion (Site Folder: 2031 PM Peak - Esc Existing+ All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (Two-Way)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	% %
South: Hendriske Road														
Lane 1	121	0.9	121	0.9	1873	0.065	100	0.6	LOS A	0.1	0.5	Full	500	0.0 0.0
Approach	121	0.9	121	0.9		0.065		0.6	NA	0.1	0.5			
East: Tolbos Road														
Lane 1	60	0.0	60	0.0	593	0.101	100	11.0	LOS B	0.3	2.4	Full	500	0.0 0.0
Approach	60	0.0	60	0.0		0.101		11.0	LOS B	0.3	2.4			
North: Hendriske Road														
Lane 1	377	0.0	377	0.0	1867	0.202	100	2.3	LOS A	0.5	3.4	Full	500	0.0 0.0
Approach	377	0.0	377	0.0		0.202		2.3	NA	0.5	3.4			
West: Tolbos Road														
Lane 1	16	0.0	16	0.0	1294	0.012	100	8.4	LOS A	0.0	0.3	Full	500	0.0 0.0
Approach	16	0.0	16	0.0		0.012		8.4	LOS A	0.0	0.3			
All Vehicles	574	0.2	574	0.2		0.202		3.0	NA	0.5	3.4			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Hendriske Road

Mov.	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From S To Exit	N	E							
Lane 1	113	8	121	0.9	1873	0.065	100	NA	NA
Approach	113	8	121	0.9		0.065			

East: Tolbos Road

Mov.	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From E To Exit	S	N							
Lane 1	2	58	60	0.0	593	0.101	100	NA	NA
Approach	2	58	60	0.0		0.101			

North: Hendriske Road

Mov. From N To Exit	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deq. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	89	233	55	377	0.0	1867	0.202	100	NA	NA
Approach	89	233	55	377	0.0		0.202			

West: Tolbos Road

Mov. From W To Exit	L2 N	Total	%HV	Cap. veh/h	Deq. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	16	16	0.0	1294	0.012	100	NA	NA
Approach	16	16	0.0		0.012			

	Total	%HV	Deq. Satn (v/c)
All Vehicles	574	0.2	0.202

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Opposing Origin Lane % veh/h per/h	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Capacity Util. veh/h	Deq. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial Queue Demand veh	Residual Queue Demand veh	Time to Residual Demand sec	Duration of Oversat sec
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South: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
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East: Tolbos Road

Lane 1	0.0	0.0	0.0	0.0
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North: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
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West: Tolbos Road

Lane 1	0.0	0.0	0.0	0.0
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LANE SUMMARY

Site: [Int 3: Hendriske Road / Williams Road_PM Peak - Esc
Existing + All Devs + 5yrs (Site Folder: 2031 PM Peak - Esc
Existing+ All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Sain	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total]	HV]	[Total]	HV]	veh/h	v/c	%	sec		[Veh	Dist.]		m	%	%
	veh/h	%	veh/h	%							m				
South: Williams Road															
Lane 1	38	0.0	38	0.0	341	0.111	100	17.4	LOS C	0.4	2.6	Full	500	0.0	0.0
Approach	38	0.0	38	0.0		0.111		17.4	LOS C	0.4	2.6				
East: Hendriske Road															
Lane 1	235	0.0	235	0.0	679	0.346	100	13.8	LOS B	1.3	9.3	Full	500	0.0	0.0
Approach	235	0.0	235	0.0		0.346		13.8	LOS B	1.3	9.3				
West: RoadName															
Lane 1	99	2.1	99	2.1	630	0.157	100	12.5	LOS B	0.5	3.6	Full	500	0.0	0.0
Approach	99	2.1	99	2.1		0.157		12.5	LOS B	0.5	3.6				
All Vehicles	372	0.6	372	0.6		0.346		13.8	LOS B	1.3	9.3				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Williams Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Sain	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit:	W	E			veh/h	v/c	%	%	
Lane 1	5	33	38	0.0	341	0.111	100	NA	NA
Approach	5	33	38	0.0		0.111			

East: Hendriske Road

Mov.	L2	T1	Total	%HV	Cap.	Deg. Sain	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit:	S	W			veh/h	v/c	%	%	
Lane 1	52	183	235	0.0	679	0.346	100	NA	NA
Approach	52	183	235	0.0		0.346			

West: RoadName

Mov.	T1	R2	Total	%HV	Cap.	Deg. Sain	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From W To Exit:	E	S			veh/h	v/c	%	%	
Lane 1	92	7	99	2.1	630	0.157	100	NA	NA
Approach	92	7	99	2.1		0.157			

	Total	%HV	Del. Sat. (v/c)
All Vehicles	372	0.6	0.346

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis										
Exit Lane Number	Station Lane Length m	Percent Oppng In Lane	Opposing Flow Rate % veh/h pc/wh	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Cap. Sat. v/c	Min. Satn Delay sec	Merge Delay sec	
There are no Exit Short Lanes for Merge Analysis at this Site.										

Variable Demand Analysis				
	Initial Queue Demand veh	Residual Queue Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Williams Road				
Lane 1	0.0	0.0	0.0	0.0
East: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0
West: RoadName				
Lane 1	0.0	0.0	0.0	0.0

LANE SUMMARY

**Site: 101 [Int 4: Hendriske Road / Rhode Road_PM Peak - Esc
Existing + All Devs + 5yrs (Site Folder: 2031 PM Peak - Esc
Existing+ All Devs + 5 yrs)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Give-Way (Two-Way)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Sain	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist. m]		m	% %
South: Rhode Road														
Lane 1	22	0.0	22	0.0	1064	0.021	100	6.2	LOS A	0.1	0.5	Full	500	0.0 0.0
Approach	22	0.0	22	0.0		0.021		6.2	LOS A	0.1	0.5			
East: Hendriske Road														
Lane 1	161	0.0	161	0.0	1865	0.086	100	2.5	LOS A	0.2	1.4	Full	500	0.0 0.0
Approach	161	0.0	161	0.0		0.086		2.5	NA	0.2	1.4			
North: RoadName														
Lane 1	24	0.0	24	0.0	1037	0.023	100	6.2	LOS A	0.1	0.6	Full	500	0.0 0.0
Approach	24	0.0	24	0.0		0.023		6.2	LOS A	0.1	0.6			
West: Hendriske Road														
Lane 1	100	2.1	100	2.1	1881	0.053	100	1.7	LOS A	0.0	0.3	Full	500	0.0 0.0
Approach	100	2.1	100	2.1		0.053		1.7	NA	0.0	0.3			
All Vehicles	307	0.7	307	0.7		0.086		2.8	NA	0.2	1.4			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)										
South: Rhode Road										
Mov.	L2	R2	Total	%HV		Cap.	Deg. Sain	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit:	W	E				veh/h	v/c	%	%	
Lane 1	8	14	22	0.0		1064	0.021	100	NA	NA
Approach	8	14	22	0.0			0.021			
East: Hendriske Road										
Mov.	L2	T1	R2	Total	%HV		Cap.	Deg. Sain	Lane Util.	Prob. SL Ov.
From E To Exit:	S	W	N			veh/h	v/c	%	%	Lane No.
Lane 1	43	93	25	161	0.0	1865	0.086	100	NA	NA
Approach	43	93	25	161	0.0		0.086			

North: RoadName

Mov.	L2	R2	Total	%HV	Cap.	Deq.	Lane	Prob.	OV.
From N					veh/h	sat	Util.	S.O.	Lane
To Exit	E	W					%	%	No.
Lane 1	7	17	24	0.0	1037	0.023	100	NA	NA
Approach	7	17	24	0.0		0.023			

West: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap.	Deq.	Lane	Prob.	OV.
From W						veh/h	sat	Util.	S.O.	Lane
To Exit	N	E	S					%	%	No.
Lane 1	25	71	4	100	2.1	1881	0.053	100	NA	NA
Approach	25	71	4	100	2.1		0.053			

Total	%HV	Deq.	S.O.	Util.	%
All Vehicles	307	0.7			0.086

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit	Short	Percent	Opposing	Critical	Follow-up	Lane	Capacity	Deq.	Min.	Merge
Lane	Lane	Opping	Flow Rate	Flow	Headway	Flow	Rate	sat	Delay	Delay
Number	Length	in	%veh/h	veh/h	sec	veh/h	veh/h	%	sec	sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial	Residual	Time for	Duration
Queue	Queue	Residual	of
Demand	Demand	Demand	Oversatn
veh	veh	sec	sec

South: Rhode Road

Lane 1	0.0	0.0	0.0	0.0
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East: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

North: RoadName

Lane 1	0.0	0.0	0.0	0.0
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West: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

LANE SUMMARY

Site: [Int 5: Lang Road / Gabriels Road_PM Peak - Esc
Existing + All Devs + 5yrs (Site Folder: 2031 PM Peak - Esc
Existing+ All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Sain	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total] veh/h	HV %	[Total] veh/h	HV %	veh/h	v/c	%	sec		[Veh]	[Dist] m		m	% %
South: Lang Road														
Lane 1	534	0.2	534	0.2	782	0.683	100	19.7	LOS C	4.4	31.1	Full	500	0.0 0.0
Approach	534	0.2	534	0.2		0.683		19.7	LOS C	4.4	31.1			
East: Gabriels Road														
Lane 1	43	0.0	43	0.0	254	0.170	100	22.6	LOS C	0.6	4.3	Full	500	0.0 0.0
Approach	43	0.0	43	0.0		0.170		22.6	LOS C	0.6	4.3			
North: Lang Road														
Lane 1	367	1.1	367	1.1	684	0.537	100	17.0	LOS C	2.7	18.8	Full	500	0.0 0.0
Approach	367	1.1	367	1.1		0.537		17.0	LOS C	2.7	18.8			
All Vehicles	944	0.6	944	0.6		0.683		18.8	LOS C	4.4	31.1			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Lang Road

Mov.	T1	R2	Total	%HV	Cap.	Deg. Sain	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit	N	E			veh/h	v/c	%	%	
Lane 1	508	25	534	0.2	782	0.683	100	NA	NA
Approach	508	25	534	0.2		0.683			

East: Gabriels Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Sain	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit	S	N			veh/h	v/c	%	%	
Lane 1	8	35	43	0.0	254	0.170	100	NA	NA
Approach	8	35	43	0.0		0.170			

North: Lang Road

Mov.	L2	T1	Total	%HV	Cap.	Deg. Sain	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From N To Exit	E	S			veh/h	v/c	%	%	
Lane 1	52	316	367	1.1	684	0.537	100	NA	NA
Approach	52	316	367	1.1		0.537			

	Total	WAV/Delay	Site (V/c)
All Vehicles	944	0.6	0.683

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Station Lane Change	Percent Opposite Lane	Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Capacity Flow Rate	Capacity	Req. Min. Satn Delay	Merge Delay
		u	%veh/h	sec	sec	veh/h	veh/h	sec	sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial Queued Demand	Residual Queued Demand	Time for Residual Demand to Clear	Duration of Oversatn
	veh	veh	sec	sec

South: Lang Road

Lane 1	0.0	0.0	0.0	0.0
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East: Gabriels Road

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

North: Lang Road

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

LANE SUMMARY

Site: [Int 6: Welgevonden Blvd / Lang Road_PM Peak - Esc
Existing + All Devs + 5yrs (Site Folder: 2031 PM Peak - Esc
Existing+ All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (Two-Way)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist]		m	% %
South: Lang Road														
Lane 1	426	0.0	426	0.0	1303	0.327	100	8.5	LOS A	1.7	12.0	Full	500	0.0 0.0
Approach	426	0.0	426	0.0		0.327		8.5	LOS A	1.7	12.0			
East: Welgevonden Blvd														
Lane 1	88	0.0	88	0.0	1936	0.046	100	0.8	LOS A	0.0	0.0	Full	500	0.0 0.0
Approach	88	0.0	88	0.0		0.046		0.8	NA	0.0	0.0			
West: Welgevonden Blvd														
Lane 1	394	0.0	394	0.0	1723	0.229	100	4.2	LOS A	1.2	8.7	Full	500	0.0 0.0
Approach	394	0.0	394	0.0		0.229		4.2	NA	1.2	8.7			
All Vehicles	908	0.0	908	0.0		0.327		5.9	NA	1.7	12.0			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Lang Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit	W	E			veh/h	v/c	%	%	
Lane 1	413	14	426	0.0	1303	0.327	100	NA	NA
Approach	413	14	426	0.0		0.327			

East: Welgevonden Blvd

Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit	S	W			veh/h	v/c	%	%	
Lane 1	13	76	88	0.0	1936	0.046	100	NA	NA
Approach	13	76	88	0.0		0.046			

West: Welgevonden Blvd

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From W To Exit	E	S			veh/h	v/c	%	%	

Lane 1	109	284	394	0.0	1723	0.229	100	NA	NA
Approach	109	284	394	0.0		0.229			

	Total	%HVD	Delay (v/c)
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All Vehicles	908	0.0	0.327
--------------	-----	-----	-------

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length	Percent Opposing Flow Rate at %veh/h	Opposing Flow Rate	Grp	Follow-up Headway Rate	Lane Capacity	Delay Rate	Min. Satn Delay	Merge Delay
				sec	sec/veh/h	veh/h	v/c	sec	sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial Queued Demand	Residual Queued Demand	Time for Residual Demand to Clear	Duration of Oversatn
veh	veh	sec	sec

South: Lang Road

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

East: Welgevonden Blvd

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

West: Welgevonden Blvd

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

LANE SUMMARY

Site: Int7 [Int 7: R304 / Welgevonden Blvd_PM Peak - Esc
Existing + All Devs + 5 yrs_Miti (Site Folder: 2031 PM Peak - Esc
Existing+ All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 110 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.	
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
South: R304															
Lane 1	908	2.7	908	2.7	1045	0.869	100	287.0	LOS F	45.8	328.0	Full	500	0.0	0.0
Lane 2	781	2.7	781	2.7	899 ¹	0.869	100	42.3	LOS D	40.5	290.4	Short	200	0.0	NA
Lane 3	271	0.0	271	0.0	318	0.849	100	64.4	LOS E	12.4	86.8	Short	70	0.0	NA
Approach	1960	2.4	1960	2.4		0.869		158.7	LOS F	45.8	328.0				
East: Welgevonden Blvd															
Lane 1	227	0.0	227	0.0	642	0.354	100	34.4	LOS C	9.1	63.5	Short	45	0.0	NA
Lane 2	220	0.0	220	0.0	321	0.686	100	53.3	LOS D	11.5	80.5	Full	500	0.0	0.0
Approach	447	0.0	447	0.0		0.686		43.7	LOS D	11.5	80.5				
North: R304															
Lane 1	256	0.0	256	0.0	1013	0.253	100	22.2	LOS C	7.1	49.8	Short	100	0.0	NA
Lane 2	738	0.6	738	0.6	996 ¹	0.741	100	23.0	LOS C	29.9	210.2	Short	200	0.0	NA
Lane 3	785	0.6	785	0.6	1059	0.741	100	54.7	LOS D	31.8	223.6	Full	500	0.0	0.0
Approach	1779	0.5	1779	0.5		0.741		36.9	LOS D	31.8	223.6				
All Vehicles	4186	1.3	4186	1.3		0.869		94.6	LOS F	45.8	328.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)

South: R304

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit	N	E			veh/h	v/c	%	%	
Lane 1	908	-	908	2.7	1045	0.869	100	NA	NA
Lane 2	781	-	781	2.7	899 ¹	0.869	100	39.1	1
Lane 3	-	271	271	0.0	318	0.849	100	24.6	2
Approach	1689	271	1960	2.4		0.869			

East: Welgevonden Blvd

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit	S	N			veh/h	v/c	%	%	

Lane 1	227	-	227	0.0	642	0.354	100	36.5	2
Lane 2	-	220	220	0.0	321	0.686	100	NA	NA
Approach	227	220	447	0.0		0.686			

North: R304

Mov.	L2	T1	Total	%HV	Cap.	Deq.	Lane	Prob.	Op.
From N To Exit	E	S			veh/h	Ratio	Util.	St. Ov.	Lane No.
Lane 1	256	-	256	0.0	1013	0.253	100	0.0	2
Lane 2	-	738	738	0.6	996 ¹	0.741	100	9.5	3
Lane 3	-	785	785	0.6	1059	0.741	100	NA	NA
Approach	256	1523	1779	0.5		0.741			
Total %HV Deq. Ratio									

All Vehicles 4186 1.3 0.869

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

Exit Lane Number	Short Lane Length (m)	Percent Opposing Flow	Opposing Flow Rate (veh/h)	Critical Gap (sec)	Follow-up Headway (sec)	Lane Capacity (veh/h)	Deq. Ratio	Min. Sain Delay (sec)	Merge Delay (sec)
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South Exit: R304

Merge Type: Priority

Exit Short Lane	2	200	0.0	966	968	3.01	2.01	785	782	1.004	2.5	34.4
Merge Lane	1	-	100.0	Merge Lane is not Opposed				966	1800	0.536	0.0	0.0

North Exit: R304

Merge Type: Priority

Exit Short Lane	1	200	0.0	1001	1012	3.04	2.03	908	711	1.277	2.9	258.4
Merge Lane	2	-	100.0	Merge Lane is not Opposed				1001	1800	0.556	0.0	0.0

Variable Demand Analysis

Initial Queue Demand (veh)	Residual Queue Demand (veh)	Time for Residual Demand to Clear (sec)	Duration of Oversat (sec)
----------------------------	-----------------------------	---	---------------------------

South: R304

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

East: Welgevonden Blvd

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

North: R304

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

LANE SUMMARY

**Site: 101v [Int 8: R44 / Fir Street_PMPeak - Esc Existing + All
Devs + 5 yrs - Conversion (Site Folder: 2031 PM Peak - Esc
Existing+ All Devs + 5 yrs)]**

Output produced by **SIDRA INTERSECTION Version: 9.1.6.228**

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h	HV %	[Total veh/h	HV %						[Veh m	Dist m				
South: R44															
Lane 1	1009	2.9	1009	2.9	1514	0.666	100	5.3	LOS A	18.7	134.2	Full	490	0.0	0.0
Lane 2	1015	3.6	1015	3.6	1524	0.666	100	4.1	LOS A	18.8	135.8	Full	490	0.0	0.0
Approach	2024	3.3	2024	3.3		0.666		4.7	LOS A	18.8	135.8				
North: R44															
Lane 1	769	4.2	769	4.2	1519	0.506	100	3.2	LOS A	11.2	81.0	Full	1150	0.0	0.0
Lane 2	769	4.2	769	4.2	1519	0.506	100	3.2	LOS A	11.2	81.0	Full	1150	0.0	0.0
Lane 3	19	0.0	19	0.0	113	0.168	100	16.1	LOS B	0.4	3.0	Short	60	0.0	NA
Approach	1557	4.1	1557	4.1		0.506		3.4	LOS A	11.2	81.0				
West: Fir Street															
Lane 1	79	0.0	79	0.0	124	0.638	100	53.9	LOS D	3.7	25.9	Full	260	0.0	0.0
Approach	79	0.0	79	0.0		0.638		53.9	LOS D	3.7	25.9				
All Vehicles	3660	3.6	3660	3.6		0.666		5.2	LOS A	18.8	135.8				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)										
South: R44										
Mov.	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SLOv. %	Ov. Lane No.	
From S To Exit:	W	N								
Lane 1	223	786	1009	2.9	1514	0.666	100	NA	NA	
Lane 2	-	1015	1015	3.6	1524	0.666	100	NA	NA	
Approach	223	1801	2024	3.3		0.666				
North: R44										
Mov.	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SLOv. %	Ov. Lane No.	
From N To Exit:	S	W								
Lane 1	769	-	769	4.2	1519	0.506	100	NA	NA	
Lane 2	769	-	769	4.2	1519	0.506	100	NA	NA	
Lane 3	-	19	19	0.0	113	0.168	100	0.0	2	
Approach	1538	19	1557	4.1		0.506				

West: Fir Street

Mov.	L2	R2	Total	%HM	Cap.	Deg.	Lane	Prob.	Op.
From W					veh/h	Satn	Util.	SL	Lane
To Exit	N	S				v/c	%	%	No.
Lane 1	21	58	79	0.0	124	0.638	100	NA	NA
Approach	21	58	79	0.0		0.638			
	Total	%HM/Deg	Satn (v/c)						
All Vehicles	3660	3.6		0.666					

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit	Station	Percent	Opposing	Critical	Follow-up	Lane	Capacity	Deg.	Min.	Merge
Lane	Lane	Oppg in	Flow Rate	Cap.	Headway	Flow		Satn	Delay	Delay
Number	Length	Lane	% veh/h pcu/h	sec	sec	veh/h	veh/h	v/c	sec	sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial	Residual	Time for	Duration
	Queued	Queued	Residual	of
	Demand	Demand	Demand	Oversatn
	veh	veh	to Clear	sec
South: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Fir Street				
Lane 1	0.0	0.0	0.0	0.0

Appendix F

SIDRA Analysis Future 2031 Traffic

LANE SUMMARY

 Site: Int1 [Int 1: R44 / Hendriske Road_AM Peak_Duel+TurnExt
- Esc Existing + All Devs + 5 yrs (Site Folder: 2031 AM Peak -
Esc Existing + All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	%	%
South: R44															
Lane 1	120	0.0	120	0.0	1507	0.080	100	6.3	LOS A	0.4	3.1	Short	80	0.0	NA
Lane 2	211	1.4	211	1.4	745	0.283	35 ⁶	17.7	LOS B	5.0	35.5	Full	500	0.0	0.0
Lane 3	591	1.4	591	1.4	739	0.799	100	24.3	LOS C	19.9	140.9	Full	500	0.0	0.0
Approach	922	1.3	922	1.3		0.799		20.4	LOS C	19.9	140.9				
East: RoadName															
Lane 1	2	0.0	2	0.0	679	0.003	100	17.7	LOS B	0.0	0.3	Full	500	0.0	0.0
Approach	2	0.0	2	0.0		0.003		17.7	LOS B	0.0	0.3				
North: R44															
Lane 1	609	1.0	609	1.0	747	0.816	100	25.3	LOS C	21.0	148.5	Full	500	0.0	0.0
Lane 2	609	1.0	609	1.0	747	0.816	100	25.3	LOS C	21.0	148.5	Full	500	0.0	0.0
Lane 3	39	0.0	39	0.0	151	0.257	100	38.5	LOS D	1.3	9.2	Short	80	0.0	NA
Approach	1258	1.0	1258	1.0		0.816		25.7	LOS C	21.0	148.5				
West: Hendriske Road															
Lane 1	610	0.0	610	0.0	679	0.898	100	40.0	LOS D	25.8	180.5	Short	80	0.0	NA
Lane 2	604	0.0	604	0.0	672	0.898	100	40.0	LOS D	25.6	179.0	Full	500	0.0	0.0
Approach	1214	0.0	1214	0.0		0.898		40.0	LOS D	25.8	180.5				
All Vehicles	3396	0.7	3396	0.7		0.898		29.4	LOS C	25.8	180.5				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

 Lane under-utilisation due to downstream effects

Approach Lane Flows (veh/h)

South: R44

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	OV.
From S To Exit	W	N	E			veh/h	v/c	%	%	Lane No.
Lane 1	120	-	-	120	0.0	1507	0.080	100	0.0	2
Lane 2	-	211	-	211	1.4	745	0.283	35 ⁶	NA	NA
Lane 3	-	590	1	591	1.4	739	0.799	100	NA	NA
Approach	120	801	1	922	1.3		0.799			

East: RoadName

Mov.	L2	R2	Total	%HV		Cap. veh/h	Delay s/veh	Lane Util. %	Prob. SL Ov. %	OV Lane No.	
From E To Exit	S	N									
Lane 1	1	1	2	0.0		679	0.003	100	NA	NA	
Approach	1	1	2	0.0			0.003				
North: R44											
Mov.	L2	T1	R2	Total	%HV		Cap. veh/h	Delay s/veh	Lane Util. %	Prob. SL Ov. %	OV Lane No.
From N To Exit	E	S	W								
Lane 1	1	608	-	609	1.0		747	0.816	100	NA	NA
Lane 2	-	609	-	609	1.0		747	0.816	100	NA	NA
Lane 3	-	-	39	39	0.0		151	0.257	100	0.0	2
Approach	1	1218	39	1258	1.0			0.816			
West: Hendriske Road											
Mov.	L2	R2	Total	%HV		Cap. veh/h	Delay s/veh	Lane Util. %	Prob. SL Ov. %	OV Lane No.	
From W To Exit	N	S									
Lane 1	61	549	610	0.0		679	0.898	100	81.0	2	
Lane 2	-	604	604	0.0		672	0.898	100	NA	NA	
Approach	61	1153	1214	0.0			0.898				
Total %HV Delay s/veh Prob. SL Ov. % OV Lane No.											
All Vehicles	3396	0.7		0.898							

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects

Merge Analysis											
Exit Lane	Station	Pre-merge Lane	Opposing Lane	Opposition	Follow-up	Lane Capacity	Req. Min. Merge	Req. Min. Merge	Req. Min. Merge	Req. Min. Merge	Req. Min. Merge
Number	Length	Length	Length	State	State	Flow	Flow	Flow	Flow	Flow	Flow
				% veh/h growth	state	veh/h	veh/h	veh/h	veh/h	veh/h	veh/h
North Exit: R44											
Merge Type: Priority											
Exit Short Lane	1	60	0.0	621	626	3.02	2.01	242	1140	0.212	1.2
Merge Lane	2	-	100.0	Merge Lane is not Opposed				621	1800	0.345	0.0

Variable Demand Analysis				
Initial Queue	Residual Queue	Initial Queue	Residual Queue	Duration of Oversat
veh	veh	veh	veh	sec
South: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
East: RoadName				
Lane 1	0.0	0.0	0.0	0.0
North: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0

Lane 2	0.0	0.0	0.0	0.0
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Project: C:\Users\Armandt.VanStraten\Zutari\1001918 - Cloetesville - Documents\05 Deliver\510 Reports\2. Status Quo Analysis\Status Quo_Transport\Sidra Analysis\1001918-Cloetesville.sip9

LANE SUMMARY

Site: [Int 2: Hendriske Road / Tolbos Road_AM Peak - Esc
Existing + All Devs + 5yrs (Site Folder: 2031 AM Peak - Esc
Existing + All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Breakdown		Lane Config	Lane Width	Gap Adj.	Prob. Block
	Total Veh/h	HV %	Total Veh/h	HV %						Pch	Dist				
South: Hendriske Road															
Lane 1	280	0.0	280	0.0	752	0.373	100	13.3	LOS B	1.5	10.2	Full	500	0.0	0.0
Approach	280	0.0	280	0.0		0.373		13.3	LOS B	1.5	10.2				
East: Tolbos Road															
Lane 1	118	0.0	118	0.0	609	0.194	100	12.8	LOS B	0.6	4.5	Full	500	0.0	0.0
Approach	118	0.0	118	0.0		0.194		12.8	LOS B	0.6	4.5				
North: Hendriske Road															
Lane 1	152	0.7	152	0.7	635	0.239	100	13.2	LOS B	0.8	5.8	Full	500	0.0	0.0
Approach	152	0.7	152	0.7		0.239		13.2	LOS B	0.8	5.8				
West: Tolbos Road															
Lane 1	78	0.0	78	0.0	148	0.527	100	54.7	LOS F	2.6	18.2	Full	500	0.0	0.0
Approach	78	0.0	78	0.0		0.527		54.7	LOS F	2.6	18.2				
All Vehicles	627	0.2	627	0.2		0.527		18.3	LOS C	2.6	18.2				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Probs.	QV
From S To Exit	W	N	E			veh/h	%	%	%	veh/h
Lane 1	6	272	2	280	0.0	752	0.373	100	NA	NA
Approach	6	272	2	280	0.0		0.373			

East: Tolbos Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Probs.	QV
From E To Exit	S	N			veh/h	%	%	%	veh/h
Lane 1	14	104	118	0.0	609	0.194	100	NA	NA
Approach	14	104	118	0.0		0.194			

North: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Probs.	QV
From N To Exit	E	S	W			veh/h	%	%	%	veh/h

Lane 1	52	94	6	152	0.7	635	0.239	100	NA	NA
Approach	52	94	6	152	0.7		0.239			

West: Tolbos Road

Mov.	L2	Total	%HV		Deg.	Lane	Prob.	Ov.
From W To Exit:	N				Cap. veh/h	Satn v/c	Util. SL %	Ov. Lane No.
Lane 1	78	78	0.0		148	0.527	100	NA
Approach	78	78	0.0			0.527		
	Total	%HV	Deg.	Satn (V/c)				
All Vehicles	627	0.2		0.527				

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane	Short Lane Length	Percent Oppng in Lane	Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Flow Rate	Lane Capacity	Deg. Satn	Min. Delay	Merge Delay
Number	m	%veh/h	veh/h	sec	sec	veh/h	veh/h	v/c	sec	sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial Queued Demand	Residual Queued Demand	Time for Residual Demand to Clear	Duration of Oversatn
	veh	veh	sec	sec
South: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0
East: Tolbos Road				
Lane 1	0.0	0.0	0.0	0.0
North: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0
West: Tolbos Road				
Lane 1	0.0	0.0	0.0	0.0

LANE SUMMARY

▽ Site: v [Int 2: Hendriske Road / Tolbos Road_AM Peak - Esc Existing + All Devs + 5yrs - Conversion (2) (Site Folder: 2031 AM Peak - Esc Existing + All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Give-Way (Two-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Grantee	Lane Length	Cap. Adj.	Prob. Block
	Route	HV %	Route	HV %						Feet	Dist				
	veh/m	%	veh/m	%						veh/m	ft/c				
South: Hendriske Road															
Lane 1	280	0.0	280	0.0	1944	0.144	100	0.2	LOS A	0.0	0.1	Full	500	0.0	0.0
Approach	280	0.0	280	0.0		0.144		0.2	NA	0.0	0.1				
East: Tolbos Road															
Lane 1	118	0.0	118	0.0	720	0.164	100	8.2	LOS A	0.6	4.1	Full	500	0.0	0.0
Approach	118	0.0	118	0.0		0.164		8.2	LOS A	0.6	4.1				
North: Hendriske Road															
Lane 1	152	0.7	152	0.7	1876	0.081	100	2.2	LOS A	0.1	0.5	Full	500	0.0	0.0
Approach	152	0.7	152	0.7		0.081		2.2	NA	0.1	0.5				
West: Tolbos Road															
Lane 1	78	0.0	78	0.0	1283	0.061	100	6.4	LOS A	0.2	1.7	Full	500	0.0	0.0
Approach	78	0.0	78	0.0		0.061		6.4	LOS A	0.2	1.7				
All Vehicles	627	0.2	627	0.2		0.164		3.0	NA	0.6	4.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Hendriske Road											
Mov.	L2	P1	R2	Route	%HV	Cap.	Deg. Satn	Lane Util.	Prob. Block	Qv	Qv
Approach	W	N	E			veh/h	%	%	%	veh/h	No.
Lane 1	6	272	2	280	0.0	1944	0.144	100	NA	NA	
Approach	6	272	2	280	0.0		0.144				
East: Tolbos Road											
Mov.	L2	R2	Route	%HV	Cap.	Deg. Satn	Lane Util.	Prob. Block	Qv	Qv	Qv
Approach	S	N			veh/h	%	%	%	veh/h	No.	No.
Lane 1	14	104	118	0.0	720	0.164	100	NA	NA		
Approach	14	104	118	0.0		0.164					

North: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From N						veh/h	Satn	Util.	SL Ov.	Lane
To Exit	E	S	W				v/c	%	%	No.
Lane 1	52	94	6	152	0.7	1876	0.081	100	NA	NA
Approach	52	94	6	152	0.7		0.081			

West: Tolbos Road

Mov.	L2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From W				veh/h	Satn	Util.	SL Ov.	Lane
To Exit	N				v/c	%	%	No.
Lane 1	78	78	0.0	1283	0.061	100	NA	NA
Approach	78	78	0.0		0.061			

Total	%HV	Deg. Satn	(v/c)
All Vehicles	627	0.2	0.164

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppng in Lane %	Flow Rate veh/h	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
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South: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
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East: Tolbos Road

Lane 1	0.0	0.0	0.0	0.0
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North: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
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West: Tolbos Road

Lane 1	0.0	0.0	0.0	0.0
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LANE SUMMARY

Site: v [Int 2: Hendriske Road / Tolbos Road_AM Peak - Esc Existing + All Devs + 5yrs - Conversion (Site Folder: 2031 AM Peak - Esc Existing + All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (Two-Way)

Lane Use and Performance																			
	Demand Flows		Arrival Flows		Cap.	Del. Spm	Lane Util.	Ave. Delay	Level of Service	95% Stack (Q)		Lane Grading	Lane Length	Gap, Adj. Block	Prob. Adj. Block				
	Total	HV%	Total	HV%						Queue	Dist					m	m	%	%
	veh/h	%	veh/h	%						veh/h	ft								
South: Hendriske Road																			
Lane 1	280	0.0	280	0.0	1944	0.144	100	0.2	LOS A	0.0	0.1	Full	500	0.0	0.0				
Approach	280	0.0	280	0.0		0.144		0.2	NA	0.0	0.1								
East: Tolbos Road																			
Lane 1	118	0.0	118	0.0	623	0.189	100	11.0	LOS B	0.7	4.8	Full	500	0.0	0.0				
Approach	118	0.0	118	0.0		0.189		11.0	LOS B	0.7	4.8								
North: Hendriske Road																			
Lane 1	152	0.7	152	0.7	1876	0.081	100	2.2	LOS A	0.1	0.5	Full	500	0.0	0.0				
Approach	152	0.7	152	0.7		0.081		2.2	NA	0.1	0.5								
West: Tolbos Road																			
Lane 1	78	0.0	78	0.0	1095	0.071	100	9.2	LOS A	0.3	2.0	Full	500	0.0	0.0				
Approach	78	0.0	78	0.0		0.071		9.2	LOS A	0.3	2.0								
All Vehicles	627	0.2	627	0.2		0.189		3.8	NA	0.7	4.8								

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay; Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap.	Del. Sain	Lane Util.	Pr. Obj.	Obj.
From To Exit	W	N	E			veh/h	sec	%	%	ft
Lane 1	6	272	2	280	0.0	1944	0.144	100	NA	NA
Approach	6	272	2	280	0.0		0.144			

East: Tolbos Road

Mov.	L2	R2	Total	%HV	Cap.	Del. Sain	Lane Util.	Pr. Obj.	Obj.
From To Exit	S	N			veh/h	sec	%	%	ft
Lane 1	14	104	118	0.0	623	0.189	100	NA	NA
Approach	14	104	118	0.0		0.189			

North: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From N						veh/h	Satn	Util.	SL Ov.	Lane
To Exit	E	S	W				v/c	%	%	No.
Lane 1	52	94	6	152	0.7	1876	0.081	100	NA	NA
Approach	52	94	6	152	0.7		0.081			

West: Tolbos Road

Mov.	L2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From W				veh/h	Satn	Util.	SL Ov.	Lane
To Exit	N				v/c	%	%	No.
Lane 1	78	78	0.0	1095	0.071	100	NA	NA
Approach	78	78	0.0		0.071			

Total	%HV	Deg.	Satn (v/c)
All Vehicles	627	0.2	0.189

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
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South: Hendriske Road

Lane 1 0.0 0.0 0.0 0.0

East: Tolbos Road

Lane 1 0.0 0.0 0.0 0.0

North: Hendriske Road

Lane 1 0.0 0.0 0.0 0.0

West: Tolbos Road

Lane 1 0.0 0.0 0.0 0.0

LANE SUMMARY

Site: [Int 3: Hendriske Road / Williams Road_AM Peak - Esc
Existing + All Devs + 5yrs (Site Folder: 2031 AM Peak - Esc
Existing + All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance																		
	Demand Flows		Arrival Flows		Cap.	Dec. Spd.	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Control	Lane Length	Cap. Adj.	Prob. Block			
	Total	HV%	Total	HV%						[Veh	Dist]					m	%	%
	veh/h	%	veh/h	%						veh/h	mi/h					%	sec	
South: Williams Road																		
Lane 1	63	1.7	63	1.7	385	0.164	100	16.8	LOS C	0.6	4.0	Full	500	0.0	0.0			
Approach	63	1.7	63	1.7		0.164		16.8	LOS C	0.6	4.0							
East: Hendriske Road																		
Lane 1	107	1.0	107	1.0	529	0.203	100	14.3	LOS B	0.7	4.9	Full	500	0.0	0.0			
Approach	107	1.0	107	1.0		0.203		14.3	LOS B	0.7	4.9							
West: RoadName																		
Lane 1	229	0.0	229	0.0	700	0.328	100	13.3	LOS B	1.2	8.6	Full	500	0.0	0.0			
Approach	229	0.0	229	0.0		0.328		13.3	LOS B	1.2	8.6							
All Vehicles	400	0.5	400	0.5		0.328		14.1	LOS B	1.2	8.6							

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab). Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Williams Road

Mov.	L2	R2	Total	%HV	Cap.	Dec. Spd.	Lane Util.	Prob. S.	Prob. O.	Av. Lane No.
From S to Exit	W	E			veh/h	mi/h	%	%	%	
Lane 1	7	56	63	1.7	385	0.164	100	NA	NA	
Approach	7	56	63	1.7	0.164					

East: Hendriske Road

Mov.	L2	T1	Total	%HV	Cap.	Dec. Spd.	Lane Util.	Prob. S.	Prob. O.	Av. Lane No.
From E to Exit	S	W			veh/h	mi/h	%	%	%	
Lane 1	38	69	107	1.0	529	0.203	100	NA	NA	
Approach	38	69	107	1.0	0.203					

West: RoadName

Mov.	T1	R2	Total	%HV	Cap.	Dec. Spd.	Lane Util.	Prob. S.	Prob. O.	Av. Lane No.
From W to Exit	E	S			veh/h	mi/h	%	%	%	
Lane 1	224	5	229	0.0	700	0.328	100	NA	NA	
Approach	224	5	229	0.0	0.328					

	Total	Veh/h	Deg. Satn (v/c)
All Vehicles	400	0.5	0.328

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppng in Lane	Flow Rate %veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
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South: Williams Road

Lane 1	0.0	0.0	0.0	0.0
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East: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
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West: RoadName

Lane 1	0.0	0.0	0.0	0.0
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LANE SUMMARY

▼ Site: 101 [Int 4: Hendriske Road / Rhode Road_AM Peak - Esc
Existing + All Devs + 5yrs (Site Folder: 2031 AM Peak - Esc
Existing + All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Give-Way (Two-Way)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back of Queue		Lane Control	Lane Length	Cap. Prot. Adj. Block	
	Total	HV %	Total	HV %											
	veh/h	%	veh/h	%	veh/h	v/c	%	sec		veh	Dist		m	%	%
South: Rhode Road															
Lane 1	24	0.0	24	0.0	1081	0.022	100	6.2	LOS A	0.1	0.5	Full	500	0.0	0.0
Approach	24	0.0	24	0.0		0.022		6.2	LOS A	0.1	0.5				
East: Hendriske Road															
Lane 1	74	0.0	74	0.0	1897	0.039	100	2.0	LOS A	0.0	0.2	Full	500	0.0	0.0
Approach	74	0.0	74	0.0		0.039		2.0	NA	0.0	0.2				
North: RoadName															
Lane 1	49	0.0	49	0.0	1175	0.042	100	6.2	LOS A	0.2	1.1	Full	500	0.0	0.0
Approach	49	0.0	49	0.0		0.042		6.2	LOS A	0.2	1.1				
West: Hendriske Road															
Lane 1	179	0.0	179	0.0	1930	0.093	100	0.8	LOS A	0.0	0.3	Full	500	0.0	0.0
Approach	179	0.0	179	0.0		0.093		0.8	NA	0.0	0.3				
All Vehicles	326	0.0	326	0.0		0.093		2.3	NA	0.2	1.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Rhode Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prot. S. Ov.	OV Lane No.
From/To	W	E			veh/h	v/c	%	%	
Lane 1	11	14	24	0.0	1081	0.022	100	NA	NA
Approach	11	14	24	0.0		0.022			

East: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prot. S. Ov.	OV Lane No.
From/To	S	W	N			veh/h	v/c	%	%	
Lane 1	22	48	3	74	0.0	1897	0.039	100	NA	NA
Approach	22	48	3	74	0.0		0.039			

North: RoadName

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From N To Exit:	E	W			veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	32	18	49	0.0	1175	0.042	100	NA	NA
Approach	32	18	49	0.0		0.042			

West: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From W To Exit:	N	E	S			veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	21	154	4	179	0.0	1930	0.093	100	NA	NA
Approach	21	154	4	179	0.0		0.093			

	Total	%HV	Deg. Satn (v/c)
All Vehicles	326	0.0	0.093

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Opposing Flow Rate % veh/h per/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
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South: Rhode Road

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

East: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

North: RoadName

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

West: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

LANE SUMMARY

Site: [Int 5: Lang Road / Gabriels Road_AM Peak - Esc
Existing + All Devs + 5yrs (Site Folder: 2031 AM Peak - Esc
Existing + All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Prob. Queue		Lane Control	Lane Capacity	Cycle Adj.	Prob. Block
	[Total Veh/h]	[HV %]	[Total Veh/h]	[HV %]						[Veh/m]	[Dist/m]				
South: Lang Road															
Lane 1	382	0.0	382	0.0	822	0.465	100	13.8	LOS B	2.0	14.1	Full	500	0.0	0.0
Approach	382	0.0	382	0.0		0.465		13.8	LOS B	2.0	14.1				
East: Gabriels Road															
Lane 1	83	0.0	83	0.0	266	0.312	100	25.2	LOS D	1.2	8.7	Full	500	0.0	0.0
Approach	83	0.0	83	0.0		0.312		25.2	LOS D	1.2	8.7				
North: Lang Road															
Lane 1	986	0.5	986	0.5	928	1.062	100	102.0	LOS F	41.7	293.3	Full	500	0.0	0.0
Approach	986	0.5	986	0.5		1.062		102.0	LOS F	41.7	293.3				
All Vehicles	1452	0.4	1452	0.4		1.062		74.4	LOS F	41.7	293.3				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Lang Road

Mov.	T	R	Total	%HV	Cap.	Delay	Lane	Prob.	OV
From	To				veh/h	sec	Util.	St. Q.	Lane
For Exit	N	E			veh/h	%	%	%	No.
Lane 1	374	8	382	0.0	822	0.465	100	NA	NA
Approach	374	8	382	0.0		0.465			

East: Gabriels Road

Mov.	L	R	Total	%HV	Cap.	Delay	Lane	Prob.	OV
	From	To			veh/h	sec	Util.	St. Q.	Lane
	From	To			veh/h	sec	%	%	No.
Lane 1	38	45	83	0.0	266	0.312	100	NA	NA
Approach	38	45	83	0.0		0.312			

North: Lang Road

Mov.	L	T	Total	%HV	Cap.	Delay	Lane	Prob.	OV
	From	To			veh/h	sec	Util.	St. Q.	Lane
	From	To			veh/h	sec	%	%	No.
Lane 1	49	937	986	0.5	928	1.062	100	NA	NA
Approach	49	937	986	0.5		1.062			

	Total	%HV	Deg. Satn (v/c)
All Vehicles	1452	0.4	1.062

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis									
Exit Lane Number	Short Lane Length m	Percent Oppng in Lane	Flow Rate % veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis				
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Lang Road				
Lane 1	0.0	0.0	0.0	0.0
East: Gabriels Road				
Lane 1	0.0	0.0	0.0	0.0
North: Lang Road				
Lane 1	0.0	29.0	112.5	NA

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LANE SUMMARY

Site: v [Int 5: Lang Road / Gabriels Road_AM Peak - Esc
Existing + All Devs + 5yrs - Conversion (2) (Site Folder: 2031 AM
Peak - Esc Existing + All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (Two-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Dsg. Satn	Lane Util.	Ave. Delay	Lane Serv. Rate	95% Breakdown		Lane Grade	Lane Length	Cap. Prob. Adj.	Prob. Block
	Total	HNVT %	Total	HNVT %						Vehicle	Dist				
	veh/h	%	veh/h	%		veh	%	sec		veh	m			%	%
South: Lang Road															
Lane 1	382	0.0	382	0.0	1827	0.209	100	0.7	LOS A	0.2	1.6	Full	500	0.0	0.0
Approach	382	0.0	382	0.0		0.209		0.7	NA	0.2	1.6				
East: Gabriels Road															
Lane 1	83	0.0	83	0.0	209	0.399	100	28.0	LOS D	1.4	9.6	Full	500	0.0	0.0
Approach	83	0.0	83	0.0		0.399		28.0	LOS D	1.4	9.6				
North: Lang Road															
Lane 1	986	0.5	986	0.5	1938	0.509	100	0.5	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	986	0.5	986	0.5		0.509		0.5	NA	0.0	0.0				
All Vehicles	1452	0.4	1452	0.4		0.509		2.1	NA	1.4	9.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)										
South: Lang Road										
Mov.	LT	RT	Total	%HV	Cap.	Dsg.	Lane	Prior.	QV	
From/To	From/To	From/To	From/To	From/To	veh/h	Satn	Util.	St.	Ln.	Lane
						veh	%	%	%	No.
Lane 1	374	8	382	0.0	1827	0.209	100	NA	NA	
Approach	374	8	382	0.0	0.209					
East: Gabriels Road										
Mov.	LT	RT	Total	%HV	Cap.	Dsg.	Lane	Prior.	QV	
From/To	From/To	From/To	From/To	From/To	veh/h	Satn	Util.	St.	Ln.	Lane
						veh	%	%	%	No.
Lane 1	38	45	83	0.0	209	0.399	100	NA	NA	
Approach	38	45	83	0.0	0.399					
North: Lang Road										
Mov.	LT	RT	Total	%HV	Cap.	Dsg.	Lane	Prior.	QV	
From/To	From/To	From/To	From/To	From/To	veh/h	Satn	Util.	St.	Ln.	Lane
						veh	%	%	%	No.

Lane 1	49	937	986	0.5	1938	0.509	100	NA	NA
Approach	49	937	986	0.5		0.509			

Total %HV/Deg.Satn (v/c)									
All Vehicles	1452	0.4		0.509					

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis										
Exit Lane Number	Short Lane Length m	Percent Oppng In Lane	Flow Rate % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis				
	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: Lang Road				
Lane 1	0.0	0.0	0.0	0.0
East: Gabriels Road				
Lane 1	0.0	0.0	0.0	0.0
North: Lang Road				
Lane 1	0.0	0.0	0.0	0.0

LANE SUMMARY

▽ Site: v [Int 5: Lang Road / Gabriels Road_AM Peak - Esc
Existing + All Devs + 5yrs - Conversion (Site Folder: 2031 AM
Peak - Esc Existing + All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Give-Way (Two-Way)

Lane Use and Performance															
	Departure Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj. Factor	Prot. Blck
	Total	HV%	Total	HV%						[Veh	Dist]				
	veh/h	%	veh/h	%		veh/h	v/c	%		sec					
South: Lang Road															
Lane 1	382	0.0	382	0.0	1827	0.209	100	0.7	LOS A	0.2	1.6	Full	500	0.0	0.0
Approach	382	0.0	382	0.0		0.209		0.7	NA	0.2	1.6				
East: Gabriels Road															
Lane 1	83	0.0	83	0.0	291	0.286	100	18.4	LOS C	1.0	6.7	Full	500	0.0	0.0
Approach	83	0.0	83	0.0		0.286		18.4	LOS C	1.0	6.7				
North: Lang Road															
Lane 1	986	0.5	986	0.5	1938	0.509	100	0.5	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	986	0.5	986	0.5		0.509		0.5	NA	0.0	0.0				
All Vehicles	1452	0.4	1452	0.4		0.509		1.6	NA	1.0	6.7				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Lang Road

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prot. St.	OV. Rate
From/To	From/To	From/To	From/To	From/To	From/To	From/To	From/To	From/To	From/To
From/To	N	E							
Lane 1	374	8	382	0.0	1827	0.209	100	NA	NA
Approach	374	8	382	0.0		0.209			

East: Gabriels Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prot. St.	OV. Rate
From/To	From/To	From/To	From/To	From/To	From/To	From/To	From/To	From/To	From/To
From/To	S	N							
Lane 1	38	45	83	0.0	291	0.286	100	NA	NA
Approach	38	45	83	0.0		0.286			

North: Lang Road

Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prot. St.	OV. Rate
From/To	From/To	From/To	From/To	From/To	From/To	From/To	From/To	From/To	From/To
From/To	E	W							

Lane 1	49	937	986	0.5	1938	0.509	100	NA	NA
Approach	49	937	986	0.5		0.509			

Total	%HV	Deg. Satn (v/c)
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All Vehicles	1452	0.4	0.509
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Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppng in Lane	Opposing Flow Rate %veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
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South: Lang Road

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

East: Gabriels Road

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

North: Lang Road

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

LANE SUMMARY

Site: [Int 6: Welgevonden Blvd / Lang Road_AM Peak - Esc
Existing + All Devs + 5yrs (Site Folder: 2031 AM Peak - Esc
Existing + All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (Two-Way)

Lane Use and Performance																	
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Av. Delay	Lane Control	95% Back of Queue		Lane Condition	Lane Length	Cap. Adj.	Prob. Block.		
	Total	HV %	Total	HV %						Veh	Dist					Veh	Dist
	veh/h	%	veh/h	%						veh/h	v/c					%	sec
South: Lang Road																	
Lane 1	279	0.8	279	0.8	1128	0.247	100	9.1	LOS A	1.1	7.9	Full	500	0.0	0.0		
Approach	279	0.8	279	0.8		0.247		9.1	LOS A	1.1	7.9						
East: Welgevonden Blvd																	
Lane 1	136	0.0	136	0.0	1938	0.070	100	0.7	LOS A	0.0	0.0	Full	500	0.0	0.0		
Approach	136	0.0	136	0.0		0.070		0.7	NA	0.0	0.0						
West: Welgevonden Blvd																	
Lane 1	797	1.1	797	1.1	1601	0.498	100	5.9	LOS A	3.5	25.1	Full	500	0.0	0.0		
Approach	797	1.1	797	1.1		0.498		5.9	NA	3.5	25.1						
All Vehicles	1212	0.9	1212	0.9		0.498		6.1	NA	3.5	25.1						

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Lang Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. Block.	Adj. Lane No.
From To Exit	W	E			veh/h	%	%	%	No.
Lane 1	271	8	279	0.8	1128	0.247	100	NA	NA
Approach	271	8	279	0.8		0.247			

East: Welgevonden Blvd

Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. Block.	Adj. Lane No.
From To Exit	S	W			veh/h	%	%	%	No.
Lane 1	17	119	136	0.0	1938	0.070	100	NA	NA
Approach	17	119	136	0.0		0.070			

West: Welgevonden Blvd

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. Block.	Adj. Lane No.
From To Exit	E	S			veh/h	%	%	%	No.

Lane 1	46	751	797	1.1	1601	0.498	100	NA	NA
Approach	46	751	797	1.1		0.498			

	Total	%HV	Deg. Satn (v/c)	
All Vehicles	1212	0.9	0.498	

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis										
Exit Lane Number	Short Lane Length m	Percent Oppng in Lane	Opposing Flow Rate % veh/h, south	Critical Gap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis				
Initial Queued Demand	Residual Queued Demand	Time for Residual Demand to Clear	Duration of Oversatn	
veh	veh	sec	sec	

South: Lang Road

Lane 1	0.0	0.0	0.0	0.0
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East: Welgevonden Blvd

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

West: Welgevonden Blvd

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

LANE SUMMARY

**Site: Int7 [Int 7: R304 / Welgevonden Blvd_AM Peak - Esc
Existing + All Devs + 5 yrs_Miti (Site Folder: 2031 AM Peak - Esc
Existing + All Devs + 5 yrs)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block
	Total	HV%	Total	HV%						[Veh	Dist]				
	veh/h	%	veh/h	%											
South: R304															
Lane 1	783	1.6	783	1.6	922	0.849	100	79.7	LOS E	33.7	239.1	Full	500	0.0	0.0
Lane 2	696	1.6	696	1.6	819 ¹	0.849	100	35.8	LOS D	30.5	216.1	Short	200	0.0	NA
Lane 3	316	0.0	316	0.0	320	0.986	100	83.6	LOS F	16.9	118.2	Short	70	0.0	NA
Approach	1795	1.3	1795	1.3		0.986		63.4	LOS E	33.7	239.1				
East: Welgevonden Blvd															
Lane 1	231	0.0	231	0.0	722	0.319	100	26.9	LOS C	7.1	49.4	Short	45	0.0	NA
Lane 2	279	0.0	279	0.0	359 ¹	0.776	100	47.0	LOS D	12.6	88.3	Full	500	0.0	0.0
Approach	509	0.0	509	0.0		0.776		37.9	LOS D	12.6	88.3				
North: R304															
Lane 1	400	0.5	400	0.5	884	0.452	100	24.9	LOS C	11.7	82.0	Short	100	0.0	NA
Lane 2	745	2.5	745	2.5	836 ¹	0.891	100	37.2	LOS D	36.1	258.4	Short	200	0.0	NA
Lane 3	817	2.5	817	2.5	917	0.891	100	137.3	LOS F	39.0	279.1	Full	500	0.0	0.0
Approach	1962	2.1	1962	2.1		0.891		76.4	LOS E	39.0	279.1				
All Vehicles	4266	1.5	4266	1.5		0.986		66.3	LOS E	39.0	279.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay; Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)

South: R304

Mov.	R1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Proj. SI	Proj. OV	Queue
For Exit	N	E			veh/h	%	%	%	%	No.
Lane 1	783	-	783	1.6	922	0.849	100	NA	NA	
Lane 2	696	-	696	1.6	819 ¹	0.849	100	12.0	1	
Lane 3	-	316	316	0.0	320	0.986	100	53.2	2	
Approach	1479	316	1795	1.3		0.986				

East: Welgevonden Blvd

Mov.	R1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Proj. SI	Proj. OV	Queue
For Exit	S	N			veh/h	%	%	%	%	No.

Lane 1	231	-	231	0.0	722	0.319	100	13.5	2
Lane 2	-	279	279	0.0	359 ¹	0.776	100	NA	NA
Approach	231	279	509	0.0	0.776				

North: R304

Mov.	L2	T1	Total	%HHV	Cap.	Deg.	Lane	Prob.	OV.
From N	E	S			veh/h	Satn	Util	SL Ov.	Lane
To Exit						v/c	%	%	No.
Lane 1	400	-	400	0.5	884	0.452	100	0.0	2
Lane 2	-	745	745	2.5	836 ¹	0.891	100	28.3	3
Lane 3	-	817	817	2.5	917	0.891	100	NA	NA
Approach	400	1562	1962	2.1	0.891				

Total	%HHV	Deg.	Satn (v/c)
All Vehicles	4266	1.5	0.986

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

Exit	Short	Percent	Opposing	Critical	Follow-up	Lane	Capacity	Deg.	Min.	Merge
Lane	Lane	Oppng in	Flow Rate	Gap	Headway	Flow		Satn	Delay	Delay
Number	Length	Lane				Rate				
	m	% veh/h	pcu/h	sec	sec	veh/h	veh/h	v/c	sec	sec

South Exit: R304

Merge Type: Priority

Exit Short Lane	2	200	0.0	976	985	3.04	2.02	817	743	1.100	2.7	103.8
Merge Lane	1	-	100.0	Merge Lane is not Opposed				976	1800	0.542	0.0	0.0

North Exit: R304

Merge Type: Priority

Exit Short Lane	1	200	0.0	975	980	3.02	2.02	783	758	1.033	2.6	51.9
Merge Lane	2	-	100.0	Merge Lane is not Opposed				975	1800	0.541	0.0	0.0

Variable Demand Analysis

Initial	Residual	Time for	Duration
Queued	Queued	Residual	of
Demand	Demand	Demand	Oversatn
		to Clear	
veh	veh	sec	sec

South: R304

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

East: Welgevonden Blvd

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

North: R304

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: 101v [Int 8: R44 / Fir Street_AMPeak - Esc Existing + All Devs + 5 yrs - Conversion (Site Folder: 2031 AM Peak - Esc Existing + All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block	
	Total	HV %	Total	HV %						[Veh]	[Dist]				
	veh/h	%	veh/h	%						veh/h	mi				
South: R44															
Lane 1	658	3.6	658	3.6	1391	0.473	100	7.4	LOS A	15.4	111.1	Full	490	0.0	0.0
Lane 2	660	3.9	660	3.9	1394	0.473	100	6.9	LOS A	15.4	111.6	Full	490	0.0	0.0
Approach	1318	3.8	1318	3.8		0.473		7.1	LOS A	15.4	111.6				
North: R44															
Lane 1	1361	2.1	1361	2.1	1411	0.965	100	37.9	LOS D	90.9	648.0	Full	1150	0.0	0.0
Lane 2	1096	2.1	1096	2.1	1136 ¹	0.965	100	53.8	LOS D	77.4	551.7	Full	1150	0.0	0.0
Lane 3	64	0.0	64	0.0	204	0.315	100	28.6	LOS C	2.0	13.9	Short	60	0.0	NA
Approach	2521	2.0	2521	2.0		0.965		44.6	LOS D	90.9	648.0				
West: Fir Street															
Lane 1	293	0.7	293	0.7	308	0.950	100	82.8	LOS F	21.4	150.6	Full	260	0.0	0.0
Approach	293	0.7	293	0.7		0.950		82.8	LOS F	21.4	150.6				
All Vehicles	4132	2.5	4132	2.5		0.965		35.3	LOS D	90.9	648.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab). Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)

South: R44

Mov.	R2	R3	Total	%HV	Cap.	Deg. Satn	Lane Util.	Proj. Satn	OV
From					veh/h	%	%	%	Wait: No.
To: E	W	N							
Lane 1	62	596	658	3.6	1391	0.473	100	NA	NA
Lane 2	-	660	660	3.9	1394	0.473	100	NA	NA
Approach	62	1256	1318	3.8		0.473			

North: R44

Mov.	R2	R3	Total	%HV	Cap.	Deg. Satn	Lane Util.	Proj. Satn	OV
From					veh/h	%	%	%	Wait: No.
To: E	S	W							
Lane 1	1361	-	1361	2.1	1411	0.965	100	NA	NA
Lane 2	1096	-	1096	2.1	1136 ¹	0.965	100	NA	NA
Lane 3	-	64	64	0.0	204	0.315	100	0.0	2

Approach 2457 64 2521 2.0 0.965

West: Fir Street

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From W To Exit:	N	S			veh/h	v/c	%	%	
Lane 1	23	269	293	0.7	308	0.950	100	NA	NA
Approach	23	269	293	0.7		0.950			
Total %HV/Deg. Satn (v/c)									
All Vehicles	4132	2.5		0.965					

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- 1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

Exit Lane Number	Short Lane Length m	Percent Oppg in Lane	Opposing Flow Rate %veh/h pcu/h	Critical Cap sec	Follow-up Headway sec	Lane Capacity Flow Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

	Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversatn sec
South: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
North: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Fir Street				
Lane 1	0.0	0.0	0.0	0.0

LANE SUMMARY

Site: Int1 [Int 1: R44 / Hendriske Road_PM Peak_Duel+TurnExt
- Esc Existing + All Devs + 5 yrs (Site Folder: 2031 PM Peak -
Esc Existing+ All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 50 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Grntd	Lane Lndn	Cap. Adj.	Prob. Block
	Total	HV %	Total	HV %						[Veh]	[Dist]				
	veh/h	%	veh/h	%						veh/h	v/c				
South: R44															
Lane 1	525	0.0	525	0.0	1117	0.470	100	8.5	LOS A	4.5	31.7	Short	80	0.0	NA
Lane 2	295	3.7	295	3.7	1219	0.242	35 ⁶	7.8	LOS A	3.1	22.2	Full	500	0.0	0.0
Lane 3	830	3.6	830	3.6	1217	0.682	100	6.3	LOS A	13.1	94.6	Full	500	0.0	0.0
Approach	1651	2.5	1651	2.5		0.682		7.3	LOS A	13.1	94.6				
East: RoadName															
Lane 1	2	0.0	2	0.0	186	0.011	100	27.4	LOS C	0.0	0.3	Full	500	0.0	0.0
Approach	2	0.0	2	0.0		0.011		27.4	LOS C	0.0	0.3				
North: R44															
Lane 1	315	3.2	315	3.2	1223	0.257	100	4.2	LOS A	3.3	23.9	Full	500	0.0	0.0
Lane 2	315	3.2	315	3.2	1223	0.257	100	4.2	LOS A	3.3	23.9	Full	500	0.0	0.0
Lane 3	120	0.0	120	0.0	249	0.482	100	19.5	LOS B	2.4	17.1	Short	80	0.0	NA
Approach	749	2.7	749	2.7		0.482		6.6	LOS A	3.3	23.9				
West: Hendriske Road															
Lane 1	148	0.5	148	0.5	210	0.707	100	32.7	LOS C	4.0	27.9	Short	80	0.0	NA
Lane 2	169	0.8	169	0.8	240	0.707	100	31.5	LOS C	4.5	31.6	Full	500	0.0	0.0
Approach	318	0.7	318	0.7		0.707		32.1	LOS C	4.5	31.6				
All Vehicles	2720	2.3	2720	2.3		0.707		10.0	LOS B	13.1	94.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

⁶ Lane under-utilisation due to downstream effects

Approach Lane Flows (veh/h)

South: R44

Mov	L2		R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Ov	Ov Lane No.
	W	N									
Lane 1	525	-	-	525	0.0	1117	0.470	100	0.0	2	
Lane 2	-	295	-	295	3.7	1219	0.242	35 ⁶	NA	NA	
Lane 3	-	829	1	830	3.6	1217	0.682	100	NA	NA	
Approach	525	1124	1	1651	2.5		0.682				

East: RoadName

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From E To Exit	S	N			veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	1	1	2	0.0	186	0.011	100	NA	NA
Approach	1	1	2	0.0		0.011			

North: R44

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From N To Exit	E	S	W			veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	1	314	-	315	3.2	1223	0.257	100	NA	NA
Lane 2	-	315	-	315	3.2	1223	0.257	100	NA	NA
Lane 3	-	-	120	120	0.0	249	0.482	100	0.0	2
Approach	1	628	120	749	2.7		0.482			

West: Hendriske Road

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From W To Exit	N	S			veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	68	80	148	0.5	210	0.707	100	0.0	2
Lane 2	-	169	169	0.8	240	0.707	100	NA	NA
Approach	68	249	318	0.7		0.707			
Total %HV Deg. Satn (v/c)									

All Vehicles 2720 2.3 0.707

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

6 Lane under-utilisation due to downstream effects

Merge Analysis

Merge Analysis												
	Exit Lane Number	Short Lane Length	Percent Opposite Lane	Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Flow Rate	Capacity	Deg. Satn	Min. Delay	Merge Delay	
		m		% veh/h per/h	sec	sec	veh/h	veh/h	v/c	sec	sec	
North Exit: R44												
Merge Type: Priority												
Exit Short Lane	1	60	0.0	865	880	3.05	2.03	329	847	0.389	2.1	3.7
Merge Lane	2	-	100.0	Merge Lane is not Opposed			865	1800	0.480	0.0	0.0	

Variable Demand Analysis

	Initial Queued Demand	Residual Queued Demand	Time for Residual Demand to Clear	Duration of Oversatn
	veh	veh	sec	sec
South: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
East: RoadName				
Lane 1	0.0	0.0	0.0	0.0
North: R44				
Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0
West: Hendriske Road				
Lane 1	0.0	0.0	0.0	0.0

Lane 2	0.0	0.0	0.0	0.0
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LANE SUMMARY

Site: [Int 2: Hendriske Road / Tolbos Road_PM Peak - Esc
Existing + All Devs + 5yrs (Site Folder: 2031 PM Peak - Esc
Existing+ All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist. m]		m	%	%
South: Hendriske Road															
Lane 1	121	0.9	121	0.9	614	0.197	100	13.0	LOS B	0.7	4.7	Full	500	0.0	0.0
Approach	121	0.9	121	0.9		0.197		13.0	LOS B	0.7	4.7				
East: Tolbos Road															
Lane 1	60	0.0	60	0.0	440	0.136	100	14.9	LOS B	0.5	3.2	Full	500	0.0	0.0
Approach	60	0.0	60	0.0		0.136		14.9	LOS B	0.5	3.2				
North: Hendriske Road															
Lane 1	377	0.0	377	0.0	725	0.520	100	15.9	LOS C	2.5	17.4	Full	500	0.0	0.0
Approach	377	0.0	377	0.0		0.520		15.9	LOS C	2.5	17.4				
West: Tolbos Road															
Lane 1	16	0.0	16	0.0	16	1.000 ⁴	100	587.1	LOS F	4.4	31.0	Full	500	0.0	0.0
Approach	16	0.0	16	0.0		1.000		587.1	LOS F	4.4	31.0				
All Vehicles	574	0.2	574	0.2		1.000		30.9	LOS D	4.4	31.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

⁴ x = 1.00 due to minimum capacity

Approach Lane Flows (veh/h)										
South: Hendriske Road										
Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Over. Ov.	Over. Lane
From S To Exit	N	E			veh/h	v/c	%	%		No.
Lane 1	113	8	121	0.9	614	0.197	100	NA	NA	
Approach	113	8	121	0.9		0.197				
East: Tolbos Road										
Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Over. Ov.	Over. Lane
From E To Exit	S	N			veh/h	v/c	%	%		No.
Lane 1	2	58	60	0.0	440	0.136	100	NA	NA	
Approach	2	58	60	0.0		0.136				
North: Hendriske Road										
Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Over. Ov.	Over. Lane
From N					veh/h	v/c	%	%		No.

To Exit	E	S	W			veh/h	v/c	%	%	No.
Lane 1	89	233	55	377	0.0	725	0.520	100	NA	NA
Approach	89	233	55	377	0.0		0.520			
West: Tolbos Road										
From \ To	Exit	From \ To	From \ To	From \ To	From \ To	From \ To	From \ To	From \ To	From \ To	From \ To
From \ To	Exit	From \ To	From \ To	From \ To	From \ To	From \ To	From \ To	From \ To	From \ To	From \ To
Lane 1	16	16	0.0			16	1.000 ⁴	100	NA	NA
Approach	16	16	0.0				1.000			
All Vehicles	574	0.2		1.000						

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

⁴ x = 1.00 due to minimum capacity

Merge Analysis

Exit	Short	Parallel	Opposing	Conflicting	Following	Lane	Opposing	Delay	Min	Merge
Lane	Lane	Lane	Lane	Lane	Lane	Lane	Lane	Lane	Lane	Lane
Rate	Rate	Rate	Rate	Rate	Rate	Rate	Rate	Rate	Rate	Rate
veh/h	veh/h	veh/h	veh/h	veh/h	veh/h	veh/h	veh/h	veh/h	veh/h	veh/h

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial	Residual	Initial	Residual
Queue	Queue	Queue	Queue
Delay	Delay	Delay	Delay
veh	veh	veh	veh

South: Hendriske Road

Lane 1 0.0 0.0 0.0 0.0

East: Tolbos Road

Lane 1 0.0 0.0 0.0 0.0

North: Hendriske Road

Lane 1 0.0 0.0 0.0 0.0

West: Tolbos Road

Lane 1 0.0 0.0 0.0 NA

LANE SUMMARY

Site: v [Int 2: Hendriske Road / Tolbos Road_PM Peak - Esc
Existing + All Devs + 5yrs - Conversion (2) (Site Folder: 2031 PM
Peak - Esc Existing+ All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Give-Way (Two-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	HV %	[Total veh/h]	HV %	veh/h	v/c	%	sec		[Veh]	Dist m		m	%	%
South: Hendriske Road															
Lane 1	121	0.9	121	0.9	1873	0.065	100	0.6	LOS A	0.1	0.5	Full	500	0.0	0.0
Approach	121	0.9	121	0.9		0.065		0.6	NA	0.1	0.5				
East: Tolbos Road															
Lane 1	60	0.0	60	0.0	686	0.088	100	8.2	LOS A	0.3	2.0	Full	500	0.0	0.0
Approach	60	0.0	60	0.0		0.088		8.2	LOS A	0.3	2.0				
North: Hendriske Road															
Lane 1	377	0.0	377	0.0	1867	0.202	100	2.3	LOS A	0.5	3.4	Full	500	0.0	0.0
Approach	377	0.0	377	0.0		0.202		2.3	NA	0.5	3.4				
West: Tolbos Road															
Lane 1	16	0.0	16	0.0	1488	0.011	100	5.8	LOS A	0.0	0.3	Full	500	0.0	0.0
Approach	16	0.0	16	0.0		0.011		5.8	LOS A	0.0	0.3				
All Vehicles	574	0.2	574	0.2		0.202		2.6	NA	0.5	3.4				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)										
South: Hendriske Road										
Mov.	T1	R2	Total	%HV		Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit	N	E				veh/h	v/c	%	%	
Lane 1	113	8	121	0.9		1873	0.065	100	NA	NA
Approach	113	8	121	0.9			0.065			
East: Tolbos Road										
Mov.	L2	R2	Total	%HV		Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit	S	N				veh/h	v/c	%	%	
Lane 1	2	58	60	0.0		686	0.088	100	NA	NA
Approach	2	58	60	0.0			0.088			

North: Hendriske Road

Flow	L2	T	R2	Total	WHV	Cap.	Deq.	Lane	Prob.	Qv.
From In						veh/m	sat	Util.	SL	Lane
To Exit	E	S	W				%	%	%	No.
Lane 1	89	233	55	377	0.0	1867	0.202	100	NA	NA
Approach	89	233	55	377	0.0		0.202			

West: Tolbos Road

Flow	L2	Total	WHV	Cap.	Deq.	Lane	Prob.	Qv.
From W				veh/m	sat	Util.	SL	Lane
To Exit	N				%	%	%	No.
Lane 1	16	16	0.0	1488	0.011	100	NA	NA
Approach	16	16	0.0		0.011			

Total	WHV	Deq.	Sat	Util.	%
All Vehicles	574	0.2	0.202		

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit	Short	Prevent	Opposing	Control	Follow-up	Lane	Capacity	Deq.	Min.	Merge
Lane	Lane	Operation	Flow Rate	Gate	Headway	Flow	Flow	Sat	Delay	Delay
Number	Number	Lane	% veh/m	sec	sec	veh/m	veh/m	%	sec	sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial	Residual	Monitor	Divide
Queue	Queue	Queue	or
Distance	Distance	Distance	Distance
veh	veh	sec	sec

South: Hendriske Road

Lane 1 0.0 0.0 0.0 0.0

East: Tolbos Road

Lane 1 0.0 0.0 0.0 0.0

North: Hendriske Road

Lane 1 0.0 0.0 0.0 0.0

West: Tolbos Road

Lane 1 0.0 0.0 0.0 0.0

LANE SUMMARY

Site: v [Int 2: Hendriske Road / Tolbos Road_PM Peak - Esc Existing + All Devs + 5yrs - Conversion (Site Folder: 2031 PM Peak - Esc Existing+ All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (Two-Way)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist m]		m	% %
South: Hendriske Road														
Lane 1	121	0.9	121	0.9	1873	0.065	100	0.6	LOS A	0.1	0.5	Full	500	0.0 0.0
Approach	121	0.9	121	0.9		0.065		0.6	NA	0.1	0.5			
East: Tolbos Road														
Lane 1	60	0.0	60	0.0	593	0.101	100	11.0	LOS B	0.3	2.4	Full	500	0.0 0.0
Approach	60	0.0	60	0.0		0.101		11.0	LOS B	0.3	2.4			
North: Hendriske Road														
Lane 1	377	0.0	377	0.0	1867	0.202	100	2.3	LOS A	0.5	3.4	Full	500	0.0 0.0
Approach	377	0.0	377	0.0		0.202		2.3	NA	0.5	3.4			
West: Tolbos Road														
Lane 1	16	0.0	16	0.0	1294	0.012	100	8.4	LOS A	0.0	0.3	Full	500	0.0 0.0
Approach	16	0.0	16	0.0		0.012		8.4	LOS A	0.0	0.3			
All Vehicles	574	0.2	574	0.2		0.202		3.0	NA	0.5	3.4			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Hendriske Road

Mov.	T1	T2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SLO %	Qv. Lane No.
From S To Exit	N	E							
Lane 1	113	8	121	0.9	1873	0.065	100	NA	NA
Approach	113	8	121	0.9		0.065			

East: Tolbos Road

Mov.	L2	T2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SLO %	Qv. Lane No.
From E To Exit	S	N							
Lane 1	2	58	60	0.0	593	0.101	100	NA	NA
Approach	2	58	60	0.0		0.101			

North: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap. veh/h	Del. Satn v/c	Lane Util. %	Prob. SL Ov. %	Op. Lane No.
From N To Exit	E	S	W							
Lane 1	89	233	55	377	0.0	1867	0.202	100	NA	NA
Approach	89	233	55	377	0.0		0.202			

West: Tolbos Road

Mov.	L2	Total	%HV	Cap. veh/h	Del. Satn v/c	Lane Util. %	Prob. SL Ov. %	Op. Lane No.
From W To Exit	N							
Lane 1	16	16	0.0	1294	0.012	100	NA	NA
Approach	16	16	0.0		0.012			

	Total	%HV	Del. Satn (v/c)
All Vehicles	574	0.2	0.202

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Start Lane	Parent Opposite Lane	Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Capacity Flow Rate	Del. Satn v/c	Min. Delay sec	Max. Delay sec
			%veh/h	sec	sec	veh/h	veh/h	sec	sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial Queue Distance	Residual Queue Distance	Time to Residual Queue Distance	Duration of Queue
veh	veh	sec	sec

South: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

East: Tolbos Road

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

North: Hendriske Road

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

West: Tolbos Road

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

LANE SUMMARY

Site: [Int 3: Hendriske Road / Williams Road_PM Peak - Esc
Existing + All Devs + 5yrs (Site Folder: 2031 PM Peak - Esc
Existing+ All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]						[Veh]	[Dist. m]				
South: Williams Road															
Lane 1	38	0.0	38	0.0	341	0.111	100	17.4	LOS C	0.4	2.6	Full	500	0.0	0.0
Approach	38	0.0	38	0.0		0.111		17.4	LOS C	0.4	2.6				
East: Hendriske Road															
Lane 1	235	0.0	235	0.0	679	0.346	100	13.8	LOS B	1.3	9.3	Full	500	0.0	0.0
Approach	235	0.0	235	0.0		0.346		13.8	LOS B	1.3	9.3				
West: RoadName															
Lane 1	99	2.1	99	2.1	630	0.157	100	12.5	LOS B	0.5	3.6	Full	500	0.0	0.0
Approach	99	2.1	99	2.1		0.157		12.5	LOS B	0.5	3.6				
All Vehicles	372	0.6	372	0.6		0.346		13.8	LOS B	1.3	9.3				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Williams Road

Mov.	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From S To Exit	W	E							
Lane 1	5	33	38	0.0	341	0.111	100	NA	NA
Approach	5	33	38	0.0		0.111			

East: Hendriske Road

Mov.	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From E To Exit	S	W							
Lane 1	52	183	235	0.0	679	0.346	100	NA	NA
Approach	52	183	235	0.0		0.346			

West: RoadName

Mov.	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From W To Exit	E	S							
Lane 1	92	7	99	2.1	630	0.157	100	NA	NA
Approach	92	7	99	2.1		0.157			

All Vehicles			
372	0.6	0.346	

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis										
Exit Lane	Short Lane	Personal Opposite	Opposite Flow Rate	Critical Gap	Follow-up Headway	Lane Capacity	Capacity	Deg. Satn	Min. Delay	Merge Delay
Number	Capacity	Capacity	veh/h	sec	sec	veh/h	veh/h	v/c	sec	sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis				
Initial Queue	Residual Queue	Initial Queue	Direction of Operation	
veh	veh	veh		sec

South: Williams Road

Lane 1 0.0 0.0 0.0 0.0

East: Hendriske Road

Lane 1 0.0 0.0 0.0 0.0

West: RoadName

Lane 1 0.0 0.0 0.0 0.0

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Project: C:\Users\Armandt.VanStraten\Zutari\1001918 - Cloeteville - Documents\05 Deliver\510 Reports\2. Status Quo Analysis\Status Quo_Transport\Sidra Analysis\1001918-Cloeteville.sip9

LANE SUMMARY

Site: 101 [Int 4: Hendriske Road / Rhode Road_PM Peak - Esc
Existing + All Devs + 5yrs (Site Folder: 2031 PM Peak - Esc
Existing+ All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Give-Way (Two-Way)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist] m		m	% %
South: Rhode Road														
Lane 1	22	0.0	22	0.0	1064	0.021	100	6.2	LOS A	0.1	0.5	Full	500	0.0 0.0
Approach	22	0.0	22	0.0		0.021		6.2	LOS A	0.1	0.5			
East: Hendriske Road														
Lane 1	161	0.0	161	0.0	1865	0.086	100	2.5	LOS A	0.2	1.4	Full	500	0.0 0.0
Approach	161	0.0	161	0.0		0.086		2.5	NA	0.2	1.4			
North: RoadName														
Lane 1	24	0.0	24	0.0	1037	0.023	100	6.2	LOS A	0.1	0.6	Full	500	0.0 0.0
Approach	24	0.0	24	0.0		0.023		6.2	LOS A	0.1	0.6			
West: Hendriske Road														
Lane 1	100	2.1	100	2.1	1881	0.053	100	1.7	LOS A	0.0	0.3	Full	500	0.0 0.0
Approach	100	2.1	100	2.1		0.053		1.7	NA	0.0	0.3			
All Vehicles	307	0.7	307	0.7		0.086		2.8	NA	0.2	1.4			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Rhode Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	OV. Lane No.
From S To Exit	W	E			veh/h	v/c	%	%	
Lane 1	8	14	22	0.0	1064	0.021	100	NA	NA
Approach	8	14	22	0.0		0.021			

East: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	OV. Lane No.
From E To Exit	S	W	N			veh/h	v/c	%	%	
Lane 1	43	93	25	161	0.0	1865	0.086	100	NA	NA
Approach	43	93	25	161	0.0		0.086			

North: RoadName

Mov.	L2	R2	Total	%HV	Cap. veh/h	Deq. Satn v/c	Lane Util. %	Prob. SLOV %	OV. Lane No.
From N To Exit	E	W							
Lane 1	7	17	24	0.0	1037	0.023	100	NA	NA
Approach	7	17	24	0.0		0.023			

West: Hendriske Road

Mov.	L2	T1	R2	Total	%HV	Cap. veh/h	Deq. Satn v/c	Lane Util. %	Prob. SLOV %	OV. Lane No.
From W To Exit	N	E	S							
Lane 1	25	71	4	100	2.1	1881	0.053	100	NA	NA
Approach	25	71	4	100	2.1		0.053			

	Total	%HV	Deq. Satn (v/c)
All Vehicles	307	0.7	0.086

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Signal Lane Control	Permitted Operation Lane	Opposing Flow Rate veh/h	Arrival Gap sec	Following Highway Flow Rate veh/h	Lane Capacity veh/h	Deq. Satn v/c	Min. Delay sec	Max. Delay sec
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There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial Queued Demand veh	Residual Queued Demand veh	Time for Residual Demand to Clear sec	Duration of Oversat sec
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South: Rhode Road

Lane 1 0.0 0.0 0.0 0.0

East: Hendriske Road

Lane 1 0.0 0.0 0.0 0.0

North: RoadName

Lane 1 0.0 0.0 0.0 0.0

West: Hendriske Road

Lane 1 0.0 0.0 0.0 0.0

LANE SUMMARY

Site: [Int 5: Lang Road / Gabriels Road_PM Peak - Esc
Existing + All Devs + 5yrs (Site Folder: 2031 PM Peak - Esc
Existing+ All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (All-Way)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist] m		m	% %
South: Lang Road														
Lane 1	534	0.2	534	0.2	782	0.683	100	19.7	LOS C	4.4	31.1	Full	500	0.0 0.0
Approach	534	0.2	534	0.2		0.683		19.7	LOS C	4.4	31.1			
East: Gabriels Road														
Lane 1	43	0.0	43	0.0	254	0.170	100	22.6	LOS C	0.6	4.3	Full	500	0.0 0.0
Approach	43	0.0	43	0.0		0.170		22.6	LOS C	0.6	4.3			
North: Lang Road														
Lane 1	367	1.1	367	1.1	684	0.537	100	17.0	LOS C	2.7	18.8	Full	500	0.0 0.0
Approach	367	1.1	367	1.1		0.537		17.0	LOS C	2.7	18.8			
All Vehicles	944	0.6	944	0.6		0.683		18.8	LOS C	4.4	31.1			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Lang Road

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From S To Exit	N	E			veh/h	v/c	%	%	
Lane 1	508	25	534	0.2	782	0.683	100	NA	NA
Approach	508	25	534	0.2		0.683			

East: Gabriels Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From E To Exit	S	N			veh/h	v/c	%	%	
Lane 1	8	35	43	0.0	254	0.170	100	NA	NA
Approach	8	35	43	0.0		0.170			

North: Lang Road

Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From N To Exit	E	S			veh/h	v/c	%	%	
Lane 1	52	316	367	1.1	684	0.537	100	NA	NA
Approach	52	316	367	1.1		0.537			

Vehicle	Flow	Delay	Stop
All Vehicles	944	0.6	0.683

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis									
Exit Lane Number	Short Lane Length (m)	Percent Opposing Flow	Opposing Flow Rate (veh/h)	Critical Gap (sec)	Follow-up Headway (sec)	Lane Capacity (veh/h)	Capacity Utilization (%)	Deg. of Sat.	Min. Merge Delay (sec)

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis				
Initial Queued Demand (veh)	Residual Queued Demand (veh)	Time for Residual Demand to Clear (sec)	Duration of Oversat (sec)	

South: Lang Road

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

East: Gabriels Road

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

North: Lang Road

Lane 1	0.0	0.0	0.0	0.0
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Project: C:\Users\Armandt.VanStraten\Zutari\1001918 - Cloeteville - Documents\05 Deliver\510 Reports\2. Status Quo Analysis\Status Quo_Transport\Sidra Analysis\1001918-Cloeteville.sip9

LANE SUMMARY

Site: [Int 6: Welgevonden Blvd / Lang Road_PM Peak - Esc
Existing + All Devs + 5yrs (Site Folder: 2031 PM Peak - Esc
Existing+ All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Stop (Two-Way)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	[Total veh/h]	HW %	[Total veh/h]	HW %	veh/h	v/c	%	sec		[Veh]	Dist. m		m	% %
South: Lang Road														
Lane 1	426	0.0	426	0.0	1303	0.327	100	8.5	LOS A	1.7	12.0	Full	500	0.0 0.0
Approach	426	0.0	426	0.0		0.327		8.5	LOS A	1.7	12.0			
East: Welgevonden Blvd														
Lane 1	88	0.0	88	0.0	1936	0.046	100	0.8	LOS A	0.0	0.0	Full	500	0.0 0.0
Approach	88	0.0	88	0.0		0.046		0.8	NA	0.0	0.0			
West: Welgevonden Blvd														
Lane 1	394	0.0	394	0.0	1723	0.229	100	4.2	LOS A	1.2	8.7	Full	500	0.0 0.0
Approach	394	0.0	394	0.0		0.229		4.2	NA	1.2	8.7			
All Vehicles	908	0.0	908	0.0		0.327		5.9	NA	1.7	12.0			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

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

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HW (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: Lang Road

Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SLOv.	Ov. Lane No.
From S To Exit	W	E			veh/h	v/c	%	%	
Lane 1	413	14	426	0.0	1303	0.327	100	NA	NA
Approach	413	14	426	0.0		0.327			

East: Welgevonden Blvd

Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SLOv.	Ov. Lane No.
From E To Exit	S	W			veh/h	v/c	%	%	
Lane 1	13	76	88	0.0	1936	0.046	100	NA	NA
Approach	13	76	88	0.0		0.046			

West: Welgevonden Blvd

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SLOv.	Ov. Lane No.
From W To Exit	E	S			veh/h	v/c	%	%	

Lane 1	109	284	394	0.0	1723	0.229	100	NA	NA
Approach	109	284	394	0.0		0.229			

Total %HMD Delay (s/veh)

All Vehicles 908 0.0 0.327

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane Number	Short Lane Length	Proportional Opposing Flow Rate	Critical Gap	Follow-up Headway	Lane Capacity Flow Rate	Deg. Satn	Min. Delay	Merge Delay
		% veh/h	sec	sec	veh/h	v/c	sec	sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial Queued Demand	Residual Queued Demand	Time for Residual Demand to Clear	Duration of Oversatn
veh	veh	sec	sec

South: Lang Road

Lane 1 0.0 0.0 0.0 0.0

East: Welgevonden Blvd

Lane 1 0.0 0.0 0.0 0.0

West: Welgevonden Blvd

Lane 1 0.0 0.0 0.0 0.0

LANE SUMMARY

Site: Int7 [Int 7: R304 / Welgevonden Blvd_PM Peak - Esc
Existing + All Devs + 5 yrs_Miti (Site Folder: 2031 PM Peak - Esc
Existing+ All Devs + 5 yrs)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 110 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance														
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Prob. Adj. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		[Veh]	[Dist. m]		m	% %
South: R304														
Lane 1	908	2.7	908	2.7	1045	0.869	100	287.0	LOS F	45.8	328.0	Full	500	0.0 0.0
Lane 2	781	2.7	781	2.7	899 ¹	0.869	100	42.3	LOS D	40.5	290.4	Short	200	0.0 NA
Lane 3	271	0.0	271	0.0	318	0.849	100	64.4	LOS E	12.4	86.8	Short	70	0.0 NA
Approach	1960	2.4	1960	2.4		0.869		158.7	LOS F	45.8	328.0			
East: Welgevonden Blvd														
Lane 1	227	0.0	227	0.0	642	0.354	100	34.4	LOS C	9.1	63.5	Short	45	0.0 NA
Lane 2	220	0.0	220	0.0	321	0.686	100	53.3	LOS D	11.5	80.5	Full	500	0.0 0.0
Approach	447	0.0	447	0.0		0.686		43.7	LOS D	11.5	80.5			
North: R304														
Lane 1	256	0.0	256	0.0	1013	0.253	100	22.2	LOS C	7.1	49.8	Short	100	0.0 NA
Lane 2	738	0.6	738	0.6	996 ¹	0.741	100	23.0	LOS C	29.9	210.2	Short	200	0.0 NA
Lane 3	785	0.6	785	0.6	1059	0.741	100	54.7	LOS D	31.8	223.6	Full	500	0.0 0.0
Approach	1779	0.5	1779	0.5		0.741		36.9	LOS D	31.8	223.6			
All Vehicles	4186	1.3	4186	1.3		0.869		94.6	LOS F	45.8	328.0			

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes.
Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Approach Lane Flows (veh/h)										
South: R304										
Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From S To Exit:	N	E			veh/h	v/c	%	%		
Lane 1	908	-	908	2.7	1045	0.869	100	NA	NA	
Lane 2	781	-	781	2.7	899 ¹	0.869	100	39.1	1	
Lane 3	-	271	271	0.0	318	0.849	100	24.6	2	
Approach	1689	271	1960	2.4		0.869				
East: Welgevonden Blvd										
Mov.	L2	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.	
From E To Exit:	S	N			veh/h	v/c	%	%		

Lane 1	227	-	227	0.0	642	0.354	100	36.5	2
Lane 2	-	220	220	0.0	321	0.686	100	NA	NA
Approach	227	220	447	0.0		0.686			

North: R304

Flow	L2	T1	Total	%HV	Cap	Delay	Lane	Proportion	Opp
From N to Exit	E	S			veh/h	sec/veh	Util %	sl %	Lane No.
Lane 1	256	-	256	0.0	1013	0.253	100	0.0	2
Lane 2	-	738	738	0.6	996 ¹	0.741	100	9.5	3
Lane 3	-	785	785	0.6	1059	0.741	100	NA	NA
Approach	256	1523	1779	0.5		0.741			

All Vehicles 4186 1.3 0.869

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

- ¹ Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Delay and stops experienced by drivers upstream of short lane entry have been accounted for.

Merge Analysis

Exit Lane	Short Lane	Percent Opposite	Opposite Flow Rate	Critical Gap	Follow-up Headway	Lane Capacity	Capacity	Delay	Min Delay	Merge Delay
Number	Length	Length	% veh/h	sec	sec/veh	veh/h	veh/h	sec	sec	sec

South Exit: R304

Merge Type: Priority

Exit Short Lane	2	200	0.0	966	968	3.01	2.01	785	782	1.004	2.5	34.4
Merge Lane	1	-	100.0	Merge Lane is not Opposed				966	1800	0.536	0.0	0.0

North Exit: R304

Merge Type: Priority

Exit Short Lane	1	200	0.0	1001	1012	3.04	2.03	908	711	1.277	2.9	258.4
Merge Lane	2	-	100.0	Merge Lane is not Opposed				1001	1800	0.556	0.0	0.0

Variable Demand Analysis

Initial Queued Demand	Residual Queued Demand	Initial Residual Demand to Clear	Duration of Observation
veh	veh	sec	sec

South: R304

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

East: Welgevonden Blvd

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

North: R304

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

LANE SUMMARY

**Site: 101v [Int 8: R44 / Fir Street_PMPeak - Esc Existing + All
Devs + 5 yrs - Conversion (Site Folder: 2031 PM Peak - Esc
Existing+ All Devs + 5 yrs)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance															
	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% Back Of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[Total veh/h]	[HV %]	[Total veh/h]	[HV %]	veh/h	v/c	%	sec		[Veh]	[Dist] m		m	%	%
South: R44															
Lane 1	1009	2.9	1009	2.9	1514	0.666	100	5.3	LOS A	18.7	134.2	Full	490	0.0	0.0
Lane 2	1015	3.6	1015	3.6	1524	0.666	100	4.1	LOS A	18.8	135.8	Full	490	0.0	0.0
Approach	2024	3.3	2024	3.3		0.666		4.7	LOS A	18.8	135.8				
North: R44															
Lane 1	769	4.2	769	4.2	1519	0.506	100	3.2	LOS A	11.2	81.0	Full	1150	0.0	0.0
Lane 2	769	4.2	769	4.2	1519	0.506	100	3.2	LOS A	11.2	81.0	Full	1150	0.0	0.0
Lane 3	19	0.0	19	0.0	113	0.168	100	16.1	LOS B	0.4	3.0	Short	60	0.0	NA
Approach	1557	4.1	1557	4.1		0.506		3.4	LOS A	11.2	81.0				
West: Fir Street															
Lane 1	79	0.0	79	0.0	124	0.638	100	53.9	LOS D	3.7	25.9	Full	260	0.0	0.0
Approach	79	0.0	79	0.0		0.638		53.9	LOS D	3.7	25.9				
All Vehicles	3660	3.6	3660	3.6		0.666		5.2	LOS A	18.8	135.8				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Approach Lane Flows (veh/h)

South: R44

Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Qv.	Qv.
From S To Exit	W	N			veh/h	v/c	%	%	Lane No.	
Lane 1	223	786	1009	2.9	1514	0.666	100	NA	NA	
Lane 2	-	1015	1015	3.6	1524	0.666	100	NA	NA	
Approach	223	1801	2024	3.3		0.666				

North: R44

Mov.	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL	Qv.	Qv.
From N To Exit	S	W			veh/h	v/c	%	%	Lane No.	
Lane 1	769	-	769	4.2	1519	0.506	100	NA	NA	
Lane 2	769	-	769	4.2	1519	0.506	100	NA	NA	
Lane 3	-	19	19	0.0	113	0.168	100	0.0	2	
Approach	1538	19	1557	4.1		0.506				

West: Fir Street

From	L2	R2	Total	%HV	Cap. veh/h	Deq. Sat'n v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From Exit	N	S							
Lane 1	21	58	79	0.0	124	0.638	100	NA	NA
Approach	21	58	79	0.0		0.638			
	Total	%HV	Deq. Sat'n (v/c)						
All Vehicles	3660	3.6		0.666					

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Merge Analysis

Exit Lane	Short Lane	Percent Opposing Flow Rate	Initial Cycle	Follow-up Highway Flow Rate	Lane Capacity	Deq. Sat'n	Min. Delay	Merge Delay
Number	Lane	Lane	sec	veh/h	veh/h	v/c	sec	sec

There are no Exit Short Lanes for Merge Analysis at this Site.

Variable Demand Analysis

Initial Queue Demand	Residual Queue Demand	Time for Residual Demand to Clear	Duration of Over-sat
veh	veh	sec	sec

South: R44

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0

North: R44

Lane 1	0.0	0.0	0.0	0.0
Lane 2	0.0	0.0	0.0	0.0
Lane 3	0.0	0.0	0.0	0.0

West: Fir Street

Lane 1	0.0	0.0	0.0	0.0
--------	-----	-----	-----	-----

In diversity there is beauty
and there is strength.

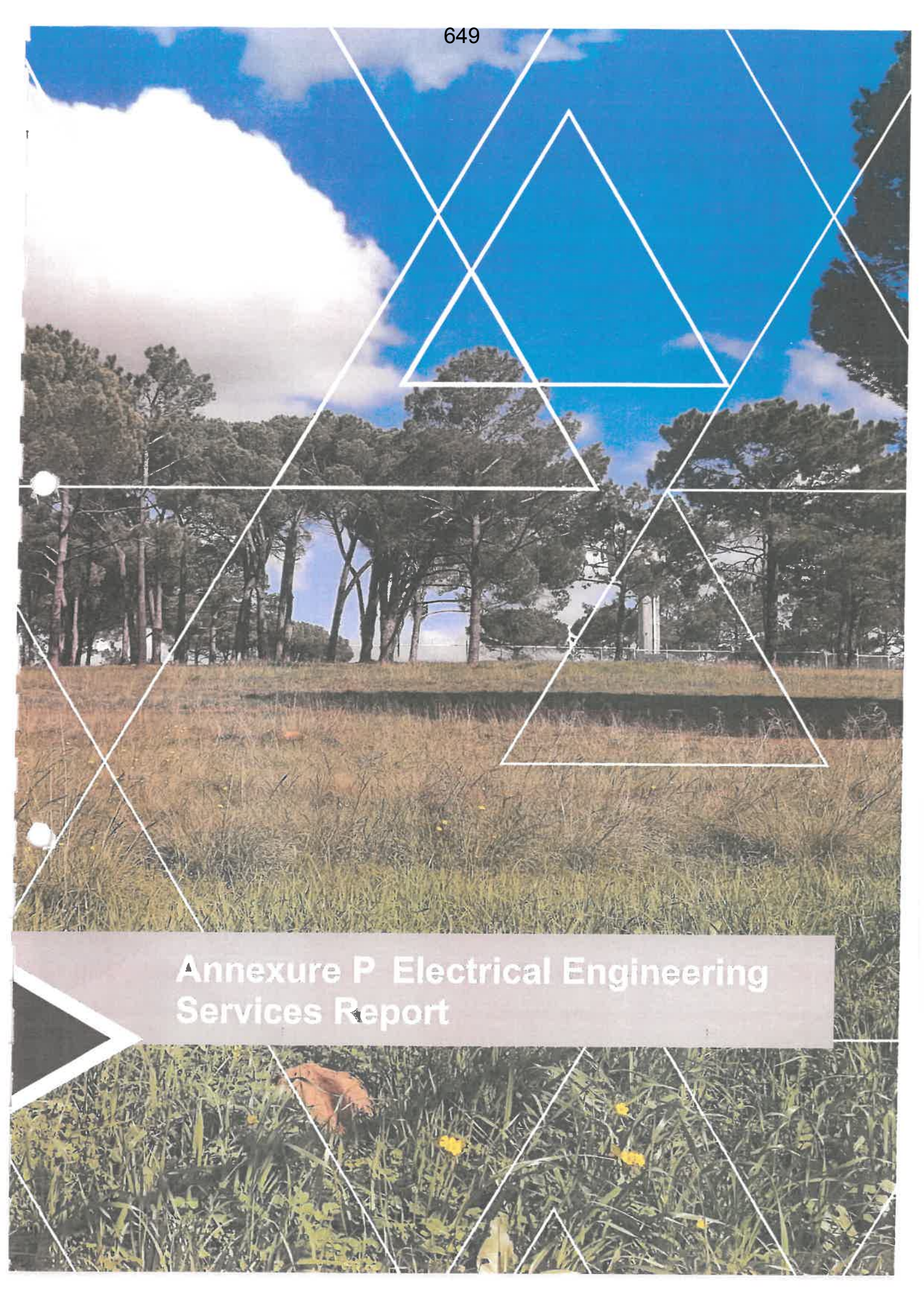
MAYA ANGELOU

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Annexure P Electrical Engineering Services Report

ELECTRICAL SERVICES REPORT FOR ERF-7001, CLOETESVILLE, STELLENBOSCH



NOVEMBER 2023 : REVISION 0

Submitted By: **Wessel Badenhorst**
De Villiers & Moore (Pty) Ltd
 (021) 976 3087
 Project No: R5244R
 Reference : 7555



de villiers & moore
 Consulting Engineers
 Electrical, Mechanical, Fire

SERVICES REPORT FOR THE ELECTRICAL SERVICES ERF-7001, CLOETESVILLE, STELLENBOSCH

1. SERVICES REPORT

This report must be read in conjunction with the drawing 1001918-231108 (see figure 1). The property is situated in Cloetesville, Stellenbosch, adjacent to existing built-up areas. The land will be developed as residential accommodation.



Figure 1: Proposed Site Layout

1.1 Purpose of this report

- Consolidate the principles, concepts and specific requirements of the client
- Provide the basic information parameters of existing electrical services
- Confirm availability of services for the proposed development

2. ELECTRICAL SUPPLY

The Electrical Supply Authority for the area is Stellenbosch Municipality.

The estimated load for the development is : **Total - 694kVA** at 11kV-level

We communicated with Stellenbosch Municipality re the existing services in the area, especially the bulk services utilized in the surrounding areas, that is already developed.

We did not receive any feedback from the municipality.

We also contacted Lyners Engineers, who do all the masterplan designs and development for the municipality. **Lyners confirmed that the network in the area will have sufficient capacity for the development of Erf-7001, as indicated above.**

3. MINIATURE SUBSTATIONS

The provisional load-calculations indicate that 2 x miniature substations will be required to supply the calculated low-voltage load. The exact positions can not be fixed now, but will be in the vicinity of the 2 x blue blocks included on the drawing in figure-1.

The minisubs will not require separate erven to be registered. We indicated one in the remaining POS-area, and the other in the water-reservoir area (can also be moved to the road-reserve outside the reservoir area).

Each minisub position will be 6x4m dedicated for the minisub.

Regards



WESSEL BADENHORST
PROFESSIONAL TECHNOLOGIST
Director



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CONSULTING ENGINEERS
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APPENDIX D: Portfolio of Evidence



STELLENBOSCH

STELLENBOSCH • PNIEL • FRANSCHHOEK

MUNISIPALITEIT • UMASIPALA • MUNICIPALITY

Nov2023

DIRECTORATE: PLANNING & ECONOMIC DEVELOPMENT

www.stellenbosch.gov.za/planning-portal/

SUBMIT COMPLETED FORM TO RELEVANT LAND USE MANAGEMENT ADMINISTRATOR

LAND USE PLANNING APPLICATION: PUBLIC PARTICIPATION PROCESS							
PORTFOLIO OF EVIDENCE (POE) CHECKLIST AND DECLARATION							
Sections 45, 46 and 55 of the Stellenbosch Municipal Land Use Planning By-Law							
Erf / Farm no	7001	Portion(s) if farm		Allotment Area	Stellenbosch		
Owner/ Applicant	Stellenbosch Municipality			LU/#	LU/16572		
Notice Period	From:	25 January 2024	To:	5 March 2024			
CONFIRMATION OR DOCUMENTATION SUBMITTED				OWNER/APPLICANT			ADMIN VERIFY
				YES	NO	N/A	
1. The declaration is duly signed				✓			
2. Applicant confirms that the public participation process was duly undertaken as instructed and attached				✓			
3. Municipality was notified in advance of the start and closing date				✓			
4. The advertisement period complies with the required 30 days				✓			
5. If applicable, confirms that the site notice was placed and kept on site for the full duration of the public participation process				✓			
6. All communications (other than notices) in respect of the public participation process are attached				✓			
Proof of notices published							
7. If applicable, photo evidence to confirm site notice (one close up and one from across the street)				✓			
8. Wording of the advertisement accurate and copy attached				✓			
9. Proof of notices published (publication date visible)				✓			
Proof of notices served							
10. Wording of notice accurate and example attached				✓			
11. Proof of all notices served to neighbouring properties attached				✓			
12. Proof of all notices served to interest and community groups attached				✓			
13. Proof of all notices served to municipal departments and organs of state (government dept's and entities) attached				✓			
Comments received							
14. All objections and comments received attached, including amended comments if relevant				✓			
15. All comments from municipal departments and organs of state received (must also be attached to POE)				✓			
16. Consent from abutting property owners obtained and attached						✓	
17. Applicant's written reply / responding comments on all the objections attached				✓			

KINDLY NOTE:

1. The POE may only be submitted once all relevant municipal departments and organs of state have submitted their comment, inclusive of the applicant's written reply thereto.
2. When any comments have been discussed or amended terms negotiated with the relevant commenting entity, the amended comments and the applicant's written reply thereto must be attached to the POE.
3. The decision-making period will only commence after receipt and confirmation of a complete POE in accordance with section 57 of the Bylaw.

COMPLETE AND SIGN THE FOLLOWING DECLARATION**DECLARATION**

I, (full names & surname) Cornelis Rudolf Schröder

and ID No: 7805315089081, as the Applicant for the above application, hereby confirms:

- 1) the public participation process for the subject application was duly undertaken in accordance with the instruction for such process and the associated requirements stipulated in the Stellenbosch Municipal Land Use Planning Bylaw;
- 2) all comments and objections received are included in the Portfolio of Evidence;
- 3) the information contained in the above checklist and the accompanied information and documentation in the Portfolio of Evidence for the concluded public participation process, are accurate and complete; and
- 4) the personal information (e.g. name, address, contact details) of interested and affected parties as supplied by the Municipality was only used for official municipal communication matters with reference to the Protection of Personal Information Act 4 of 2013 (POPI).

Duly signed on 13 September 2024 at George
Date Place

**Rudolf
Schröder**

Digitally signed by Rudolf Schröder
DN: cn=Rudolf Schröder,
ou=Normal,
email=Rudolf.Schröder@zutari.com
Date: 2024.09.13 08:31:43 +02'00'

Signature

For office use only			
	NAME	SIGNATURE	DATE
VERIFIED BY ADMINISTRATIVE OFFICER			
CHECKED BY TOWN PLANNER			

NOTES TO BE RECORDED:

Public participation Report

Cloetesville Housing Development - Rezoning and Subdivision of Erf 7001 Stellenbosch.

Submission date: 2024/09/13

Document number: 1

Revision: 1

Document control record

Document prepared by:

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Document Control						
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0	2024/04/09	First Draft	Thuli Ndlovu	Rudolf Schröder	Rudolf Schröder	Rudolf Schröder
1	2024/09/13	Final Report	Rudolf Schröder	Thuli Ndlovu	Rudolf Schröder	Chris vd Walt
Current revision		1				

Approval			
Author signature		Approver signature	
Name		Name	
		Chris van der Walt	
Title		Title	
		Project Executive	

Contents

1 Project Context and Introduction	5
2 Pre-Application	6
3 Application for Rezoning and Subdivision	6
4 Section 41 Compliance Letter - Confirmation of Complete Application Submitted	8
5 Stakeholder Engagement and Public Participation	9
5.1 Public notice in the Local Newspaper (Eikestadnuus)	9
5.2 Site Notice	10
5.3 Notice to affected property	13
5.4 Notice to Community Organisations	17
5.5 Notices placed on Municipal Website	18
5.6 Request for comments from Ward Councillor	20
5.7 Compliance with Public Participation Requirements	20
6 Comments Received	21
6.1 Categories of comments received from the public.	21
6.1.1 MAIN CATEGORY: INFRASTRUCTURE AND URBAN PLANNING CONCERNS	22
6.1.1.1 Sub-category: Parking Concerns	22
6.1.1.2 Sub-category: Overpopulation and Pressure on Infrastructure	23
6.1.1.3 Sub-category: Building Regulations	23
6.1.2 MAIN CATEGORY: SECURITY AND SAFETY	24
6.1.2.1 Sub-category: Crime and security concerns, as well as security measures	24
6.1.3 MAIN CATEGORY: IMPACT ON PROPERTY VALUES	25
6.1.3.1 Sub-category: Property Value	25
6.1.4 MAIN CATEGORY: AFFORDABLE HOUSING AND SOCIAL IMPACT	26
6.1.4.1 Sub-category: Affordable Housing	26
6.1.5 MAIN CATEGORY: TRAFFIC AND TRANSPORTATION	26
6.1.5.1 Sub-category: Traffic Congestion	26
6.1.5.2 Sub-category: Non-motorised Transport and Public Services	27
6.1.6 MAIN CATEGORY: Environmental Impact and Sustainability	27
6.1.6.1 Sub-category: Environmental impact	27
6.1.6.2 Sub-category: impact of the planned stormwater detention pond	28
6.1.7 MAIN CATEGORY: Incomplete Application and Lack of Documentation	29
6.1.7.1 Sub-category: Incomplete application	29
6.2 Comments received from Municipal Departments.	29
7 Conclusion	30
Annexure A – Comment Tracker	31
Annexure B - Comments Received from the Public	31
Annexure C – POE Checklist & Declaration	31
Annexure D – Comments Received from Municipal Departments	31

Figures

Figure 1: Subdivisional layout of Erf 7001 Stellenbosch

Figure 2: Screenshot of submission of application

Figure 3: Section 41 Compliance letter

Figure 4: Public Notice as published in Eikestadnuus

Figure 7: Site notice up-close on Erf 7001 Stellenbosch

Figure 8: Site notice across the street on Erf 7001 Stellenbosch

Figure 9: Example of letter sent to affected property owners

Figure 10 Example of letter sent to affected property owners

Figure 11: Example of proof of PostNet waybills

Figure 12: Example of email sent requesting comments from interest groups

Figure 13: Example of email sent requesting comments from interest groups

Figure 14: Example of email sent requesting comments from interest groups

Figure 5: Screenshot of notice placed on municipal website

Figure 6: Screenshot of notice placed on municipal website

Tables

Table 1: Advertising instruction for public participation process

Table 2: List of affected property owners

Table 3: List of interest groups requested for comments

Table 4 Main and sub-categories of comments received

Annexures

Annexure A - Cloetesville response to comments matrix

Annexure B - Comments Received from the Public

Annexure C - Comments received from External Departments.

1 Project Context and Introduction

Zutari (Pty) Ltd was appointed by Stellenbosch Municipality (housing Department) to prepare and submit an application to Stellenbosch Municipality on their behalf to obtain town planning and development rights for a housing development on Erf 7001 Stellenbosch.

The application is made for the rezoning and subdivision of the land parcel known as Erf 7001 Cloeteville, Stellenbosch in order to create additional housing opportunities to the medium to upper (GAP) target market. The aim of the project is to address the following:

- Housing needs in Cloeteville for the medium to upper income housing units also known as GAP; and
- Ensure that social and economic sustainability of the inhabitants of Cloeteville and beneficiaries as defined by the Stellenbosch Municipality.



Figure 1: Subdivisional layout of Erf 7001 Stellenbosch

An application has been submitted in terms of Section 15(2) for the rezoning of the area known as Erf 7001 and to simultaneously apply in terms of the Stellenbosch Municipality Land Use Management By-laws, 2023 for the permanent departure from the development parameters of the zoning scheme; to subdivide the erf into various land portions as depicted on the attached subdivision layout plan; for the closure of a part of a public space and for a consent use to erect a telecommunications mast on the portion to be zoned as Public Open Space Zone.

2 Pre-Application

In terms of **Section 37** of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2023:

- (1) The Municipality may require an owner who intends to submit an application or his or her agent to meet with the authorized employee and, where applicable, with employees of other relevant organs of state for a pre-application consultation before he or she submits an application to the Municipality in order to determine the information and documents that must be submitted with the application.
- (2) The Municipality may issue guidelines regarding—
 - (a) applications that require a pre-application consultation;
 - (b) the nature of the information and documents that must be submitted with an application;
 - (c) the attendance of employees from the Municipality or other organs of state at a pre-application consultation; and
 - (d) the procedures at a pre-application consultation.
- (3) The Municipality must keep minutes of the proceedings of a pre-application consultation.

In terms of this application and the development proposal contained herein, several consultation sessions were held with the project stakeholders and relevant municipal officials and a formal pre-application was submitted to the Municipality on 13 September 2023, whereafter a pre-planning consultation was held with the Stellenbosch Municipality's Planning Department. There were technical adjustments to the layout plan that were required and it was confirmed that the applicant can proceed with the submission of a formal rezoning and subdivision application.

3 Application for Rezoning and Subdivision

A Rezoning and Subdivision application was submitted on 30 November 2023 for the following:

- a) In terms of Section 15(2)(a) of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2023, for the rezoning of Erf 7001 Stellenbosch from "Public Open Space Zone" to a "subdivisional area" in order to allow for the following uses:
 - 201 Conventional Residential Zone Erven
 - 5 Public Open Space Zone Erven
 - 1 Utility Services Zone Erf

- Public Roads
- b) In terms of Section 15(2)(d) of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2023, for a permanent departure;
- To relax the parking requirements from 2 parking bays to 1 parking bay per dwelling house.
 - To relax the street building line from 2m (up to 250m²) to 3m (251m² to 500m²) to 1m and the common building lines from 1m to 0m for all residential zoned properties.
- c) In terms of Section 15(2)(d) of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2023, for the subdivision of Erf 7001 into 208 erven, namely:
- Erf 1 to Erf 201 (to be zoned Conventional Residential Zone) ranging from $\pm 120\text{m}^2$ to $\pm 300\text{m}^2$ (total of 3.3ha).
 - Erf 202 ($\pm 945\text{m}^2$), Erf 203 ($\pm 548\text{m}^2$), Erf 204 ($\pm 261\text{m}^2$), Erf 205 ($\pm 5866\text{m}^2$) and Erf 206 ($\pm 8.4\text{m}^2$) to be zoned Public Open Space Zone;
 - Erf 207 ($\pm 6477\text{m}^2$) to be zoned Utility Services Zone;
 - Erf 208 ($\pm 17921\text{m}^2$) to be zoned Public Road and Parking Zone.
- d) In terms of Section 15(2)(n) of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2023, for the closure of a part of a public open space (Erf 7001, Stellenbosch).
- e) In terms of Section 15(2)(o) of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2023, for consent use to erect a telecommunication mast on the portion to be zoned as Public Open Space Zone (Erf 205).

APLA Portal (ArcGIS For Local Authorities)

View town planning applications: Application summary

Application summary | Property | Application | Applicant | Agent | Required documentation

Thank you for submitting your application.

Created date:	2023/11/30 16:49
Created by:	rudolf.schroder@zutarf.com
Application id:	591
Reference number:	TP591/2023
Status:	Submission
Progress(%):	2
Description:	Application is made for the rezoning and subdivision of the land parcel known as Erf 7001 Cloetesville, Stellenbosch in order to create additional housing opportunities to the medium to upper (GAP) target market.

Figure 2: Screenshot of submission of application

4 Section 41 Compliance Letter - Confirmation of Complete Application Submitted

The application for the Rezoning and Subdivision of Erf 7001 Stellenbosch, was submitted to the Municipality's Planning Department in terms of Section 15 of the Stellenbosch Municipality Land Use Planning By-Law, 2023 on 24 January 2024.

A Section 41 Compliance letter was issued on 24 January 2024 confirming that the application is deemed to be complete and that the prescribed public participation process in accordance with Section 41(7) can now be undertaken.



STELLENBOSCH
STELLENBOSCH • PNIEL • FRANSCHHOEK
MUNICIPALITEIT • UMASIPALA • MUNICIPALITY

Application Number: LU/16572 (TP591/2023)

Our File Reference Number: Erf 7001, Stellenbosch

Your Reference Number:

Enquiries: P April / B Mdoda

Contact No: 021 – 808 8683 / 8690

Email address: Pedro.Auri@stellenbosch.gov.za / Bule'wa.Mdoda@stellenbosch.gov.za

PER E-MAIL: Rudolph.schroeder@zutari.com

Sir

APPLICATION FOR REZONING, SUBDIVISION, CONSENT USE, PERMANENT DEPARTURE AND CLOSURE OF A PART OF A PUBLIC SPACE : ERF 7001, HENDRICKSE STREET, STELLENBOSCH

1. Receipt of your application with above particulars is herewith acknowledged in terms of Section 41 of the Stellenbosch Municipal Land Use Planning Bylaw.
2. The application is now considered complete for processing, which requires that the prescribed public participation process as contemplated in terms of Section 41(7) of the said Bylaw must be undertaken.
3. It will be required from the Applicant to undertake the necessary public participation process in terms of Sections 45(12) and 46(9) of the said Bylaw. The Municipality will however undertake the required notification of the application to all applicable internal Municipal Departments as contemplated in terms of Section 51(1) of the said Bylaw.
4. The Applicant may not share any personal information of interested and affected parties and landowners as supplied by the Municipality for any other reason but to advertise the application in terms of the Bylaw. This includes personal information relating to comments or objections received. The applicant must ensure that the personal data is securely kept.

Figure 3: Section 41 Compliance letter

5 Stakeholder Engagement and Public Participation

The proposed rezoning and subdivision of Erf 7001 Stellenbosch located in the neighbourhood of Cloetesville, has been subjected to a thorough public participation process in terms of the provisions for public participation as set out in Section 41(7) of the Stellenbosch Municipality Land Use Planning By-Law, 2023, which entailed the following:

Table 1: Advertising instruction for public participation process

<u>ADVERTISING INSTRUCTION</u>	<u>YES</u>	<u>NO</u>
Advertise in press (Eikestadnuus)	✓	
Notice on the property	✓	
Registered letters to affected property owners	✓	
Registered letters to community organizations	✓	
External departments		✓

More details regarding each of these are provided in the section below:

5.1 Public notice in the Local Newspaper (Eikestadnuus)

Notice of the proposed rezoning and subdivision of Erf 7001 Stellenbosch, has been published in two official languages which are English and Afrikaans in the local newspaper (Eikestadnuus), on 25 January 2024 as prescribed in Section 45(2) of the Stellenbosch Municipal Land Use Planning By-Law, 2023.

STELLENBOSCH
MUNICIPALITY • MUNISIPALITEIT

NOTICE OF LAND DEVELOPMENT APPLICATION BY THE STELLENBOSCH MUNICIPAL AREA
NOTICE NUMBER: 4/2024

APPLICATION FOR REZONING, SUBDIVISION, CONSIST USE, DEPARTURE AND CLOSURE OF A PART OF A PUBLIC SPACE OF ERF 7001 STELLENBOSCH

Application Address: Erf 7001 Stellenbosch, Hendrickse Street, Cloeneville, Stellenbosch
Applicant: Zutaal, represented by Rudolf Schröder, rudolf.schroder@zutaal.com
Owner: Stellenbosch Municipality, NPH Building, 1st Floor, c/o Rynveld and Van Riebeeck Streets, Stellenbosch, 7600
Application Reference: LU/16572 and TP991/2023

Description of land development applications:
a) In terms of Section 152(2)(a) of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2023, for the rezoning of Erf 7001 Stellenbosch from "Public Open Space Zone" to a "subdivisional area" in order to allow for the following uses:
• 201 Conventional Residential Zone (Town)
• 5 Public Open Space Zone (Town)
• 1 Utility Services Zone (Town)
• Public Road
b) In terms of Section 152(2)(b) of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2023, for a permanent departure:
• to relax the parking requirements from: 2 parking bay per dwelling house
• to relax the street building line from 2m (up to 250m²) and 3m (251m² to 500m²) to 1m and the common building line from 1m to 0m for all residential zoned properties.
c) In terms of Section 152(2)(c) of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2023, for the subdivision of Erf 7001 into 208 erven, namely:
• Erf 1 to Erf 201 (to be zoned Conventional Residential Zone) ranging from 1120m² to 1300m² (total of 3,3 ha)
• Erf 202 (1945m²), Erf 203 (1548m²), Erf 204 (1926m²), Erf 205 (1586m²) and Erf 206 (19,8m²) to be zoned Public Open Space Zone
• Erf 207 (10477m²) to be zoned Utility Services Zone
• Erf 208 (117922m²) to be zoned Public Road and Parking Zone
d) In terms of Section 152(2)(d) of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2023, for the closure of a part of a public space (Erf 7001, Stellenbosch).
e) In terms of Section 152(2)(e) of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2023, for consent use to erect a telecommunications mast on the portion to be zoned as Public Open Space Zone (Erf 205).

Notice is hereby given in terms of the said By-law that the above-mentioned application has been submitted to the Stellenbosch Municipality for consideration. The application is available for inspection on the Planning Portal of the Stellenbosch Municipal Website for the duration of the public participation process at the following address: <https://www.stellenbosch.gov.za/planning/documents/planning-notices/land-use-applications-advertisements>. If the website or documents cannot be accessed, an electronic copy of the application can be requested from the Applicant.

Written comments, which must include the reference to the application, the name, contact details and physical address of the person to submit the comments, the reasons for the comments, and the interest of the person in the application, may be submitted in terms of Section 50(5) of the said By-law to the Applicant by electronic mail as follows: Zutaal, attention Rudolf Schröder at rudolf.schroder@zutaal.com. By lodging an objection, comment, or representation, the person doing so acknowledges that information may be made available to the public and to the applicant.

The comments must be submitted within 30 days from the date of this notice to be received on or before the closing date of (25 February 2024). It should be noted that the Municipality, in terms of Section 50(5) of the said By-law, may refuse to accept any comments/objection received after the closing date.

For any enquiries on the application or the above requirements, or if you are unable to write and/or submit your comments as provided for, you may contact the Applicant for assistance at the e-mail address provided or telephonically at +27 48 805 5400 / 083 3905963 during normal office hours.

KENSKEMMING VAN GRONDONTWIKKELINGSANSOEK IN DIE STELLENBOSCH MUNISIPALE AREA
KENSKEMMING ENDOORLOOPE, AFWYKING IN DIE SUBDIVISIE VAN 'N DEELTE VAN 'N PUBLIEKE RUIMTE VAN ERF 7001 STELLENBOSCH

Adres van persoon: Erf 7001 Stellenbosch, Hendrickse Street, Cloeneville, Stellenbosch
Aansoeker: Zutaal, verteenwoordig deur Rudolf Schröder, rudolf.schroder@zutaal.com
Eienaar: Stellenbosch Munisipaliteit, NPH Gebou, 1ste Vloer, c/o Rynveld en Van Riebeeck Streets, Stellenbosch, 7600
Aansoek Verwysing: LU/16572 and TP991/2023

Bespreking van grondontwikkelingsaansoek:
a) Ingevolge Artikel 152(2)(a) van die Stellenbosch Munisipale Verordening op Munisipale Grondgebruikbeplanning, 2023, vir die heraanwysing van Erf 7001 Stellenbosch van "Openbare Openbare Ruimte" na 'n "onderverdelingsgebied" om voorsiening te maak vir die volgende geboude:
• 201 erwe vir konvensionele residensiële zone.
• 5 Openbare Openbare Ruimte zone.
• 1 Nutsdiens zone.
• Openbare pad.
b) Ingevolge Artikel 152(2)(b) van die Stellenbosch Munisipale Verordening op Munisipale Grondgebruikbeplanning, 2023, vir permanente afwyking:
• Verlating van die minimum parkeervereistes van 2 parkeerplekke na 1 parkeerplek per woonas.
• Afwyking van die standaard straat boulyn van 2 meter (tot en met 250m²) en 3 meter (251m² na 500m²) na 1 meter vir die gesamenlike boulyn van 1 meter na 0 meter vir al die residensiële gesoneerde erwe.
c) Onderverdeling van Erf 7001 Stellenbosch ingevolge Artikel 152(2)(d) van die Stellenbosch Munisipale Verordening op Grondgebruikbeplanning 2023 in 208 erwe, as volg:
• Erf 1 tot Erf 201 (gewone residensiële zone) met erwe met 'n grootte van 1120m² tot 1300m² (totaal van 3,3 ha)
• Erf 202 (1945m²), Erf 203 (1548m²), Erf 204 (1926m²), Erf 205 (1586m²) en Erf 206 (19,8m²) tot 'n Openbare Openbare Ruimte zone.
• Erf 207 (10477m²) Nutsdiens zone.
• Erf 208 (117922m²) PUBLIEKE PAD EN PARKEERZONE.
d) Ingevolge Artikel 152(2)(d) van die Stellenbosch Munisipale Verordening op Munisipale Grondgebruikbeplanning, 2023, vir die sluiting van 'n gedeelte van 'n openbare ruimte (Erf 7001 Stellenbosch).
e) Ingevolge Artikel 152(2)(e) van die Stellenbosch Munisipale Verordening op Munisipale Grondgebruikbeplanning, 2023, vir 'n toestemmingsgebruik vir die oprig van 'n telekommunikasie mast op 'n gedeelte van die erf wat as Openbare Openbare Ruimte gesoneer is (Erf 205).

Kennis word hiermee gegee in terme van die genoemde Verordeninge dat bovermelde aansoek by die Stellenbosch Munisipaliteit ingedien is vir oorsig. Die aansoek is beskikbaar vir insae op die Beplanning Portal van die Stellenbosch Munisipaliteit se webtuiste vir die tydperk van die publieke deelname proses by die volgende adres: <https://www.stellenbosch.gov.za/planning/documents/planning-notices/land-use-applications-advertisements>. Indien die webtuiste of kenmerklike dokumente nie toeganklik is nie, kan die Aansoeker versoek word om 'n elektroniese kopie beskikbaar te stel.

Skriflike kommentaar, wat besonderhede ten oorsigte van die verwysings norme van die aansoek, die naam, fisiese adres en kontak besonderhede van die persoon wat die kommentaar lewer, die redes vir die kommentaar en die belang van die persoon wat die kommentaar lewer in die aansoek, kan ingedien word in terme van Artikel 50 van die genoemde Verordeninge aan die Aansoeker by wyle van elektroniese pos as volg: Zutaal vir aandag Rudolf Schröder by rudolf.schroder@zutaal.com. Deur 'n beswaar, kommentaar of versoek te rig, erken die persoon wat die versoek rigging dat die publiek en alle die aansoeker beskikbaar gestel kan word.

Die kommentaar moet binne 30 dae vanaf die datum van hierdie kenskemmering gestuur word en moet ontvang word op of op die beste dag van die sluitings datum van (25 Februarie 2024). Daar moet kennis geneem word dat die Munisipaliteit, ingevolge Artikel 50(5) van die genoemde Verordening, mag weier om enige kommentaar/versoek wat na die sluitingsdatum ontvang word, te aanvaar.

Indien daar enige vrae is op die aansoek of bovermelde vereistes vir die lewer van 'n kommentaar is, of indien dit nie moontlik is om gestruemde kommentaar te lewer of die kommentaar op die wyse te lewer soos voorsiening gemaak is, kan die Aansoeker gestel word vir bystand by die vermelde elektroniese pos adres of telefonies by +27 48 805 5400/0833905963 gedurende normale kantoor ure.

Figure 4: Public Notice as published in Eikestadnuus – 25 January 2024

The closing date for comments according to the notice was 25 February 2024, but was later extended to 5 March 2024 as the sites notices and some of the notification letters were only erected and sent on 5 February 2024.

5.2 Site Notice

A notice of the proposed rezoning and subdivision was displayed on the frontage of Erf 7001 Stellenbosch on 5 February 2024 as prescribed in sections 45 and 48 of the Stellenbosch Municipal Land Use Planning By-law, 2023. The notice displayed was published in two official languages (English and Afrikaans) as prescribed by the municipal by-laws and displayed in the following two locations:



Figure 5 - Location of Site Notices

Document number 1, Revision 1, Date 2024/09/13



Figure 7: Site notice on Erf 7001 Stellenbosch

5.3 Notice to affected property

A letter was sent to affected property owners and organisations regarding the proposed rezoning and subdivision of Erf 7001 Stellenbosch through PostNet on 25 January 2024 and



5 February 2024 as prescribed in section 46 of the Stellenbosch Municipal Land Use Planning By-law, 2023.

The table below provides details of all affected property owners and organisations that were notified.

Table 2: List of affected property owners

	Affected person's Title:	Property description:
1	Mr/Mrs Barends	Erf 7013
2	Mr/Mrs Beukes	Erf 8963
3	Mr/Mrs Bock	Erf 14748
4	Mr/Mrs Botha/De Villiers-Botha	Erf 14226
5	Mr/Mrs Bucchianeri	Erf 6979
6	Mr/Mrs Christians	Erf 7002
7	Mr/Mrs Claassens	Erf 6975
8	Mr/Mrs Coetsee	Erf 13769
9	Mr/Mr Coetzee	Erf 7017
10	Mr/Mrs Combrink	Erf 13770
11	Mr/Mrs Cornelissen	Erf 14228
12	Mr/Mrs Damonse	Erf 6982
13	Mr/Mrs Davidse	Erf 7012
14	Mr/Mrs Davies	Erf 14618
15	Mr/Mrs De Kock	Erf 14747
16	Mr/Mrs De Villiers	Erf 14749
17	Mr/Mrs Dewig/ North-Dewig	Erf 14235
18	Mr/Mrs Ellis	Erf 14227
19	Mr/Mrs Evetts	Erf 13771
20	Mr/Mrs F Rhode	Erf 6981
21	Mr/Mrs Fararo	Erf 6980
22	Mr/Mrs Ford	Erf 13771
23	Mr/Mrs Frans	Erf 6978
24	Mr/Mrs Geldenhuys	Erf 14745
25	Mr/Mrs Goosen	Erf 14236
26	Mr/Mrs Greef	Erf 13774
27	Mr/Mrs Grimbek	Erf 14237
28	Mr/Mrs Hendrikse	Erf 7016
29	Mr/Mrs Jansen Van Vuuren	Erf 14574
30	Mr/Mrs Kahts	Erf 13777

31	Mr/Mrs Kassier	Erf 14573
32	Mr/Mrs Krige	Erf 7018
33	Mr/Mrs Lourens	Erf 14225
34	Mr/Mrs Muller	Erf 12063
35	Mr/Mrs Muller/ Van Gend-Muller	Erf 14746
36	Mr/Mrs Prinsloo	Erf 6917
37	Mr/Mrs Parnell	Erf 14240
38	Mr/Mrs Peddie	Erf 7015
39	Mr/Mrs Petersen	Erf 7019
40	Mrs/Mrs Rhode	Erf 6976
41	Mr/Mrs Samuels	Erf 6984
42	Mr/Mrs Seconds	Erf 6983
43	Mr/Mrs September	Erf 7014
44	Mr/Mrs Shabodies/Cornelson	Erf 6985
45	Mr/Mrs Siebritz	Erf 6977
46	Mr/Mrs Smith	Erf 6986
47	Mr/Mrs Stander	Erf 14241
48	Mr/Mrs Strydom	Erf 6918
49	Mr/Mrs Strydom	Erf 8964
50	Mr/Mrs Theunissen	Erf 7020
51	Mr/Mrs Van Der Merwe	Erf 13775
52	Mr/Mrs Van Jaarsveld	Erf 14744
53	Mr/Mrs Rensburg	Erf 14224
54	Stoneleigh (PTY) LTD	Erf 14229
55	Stoneleigh (PTY) LTD	Erf 14238
56	Stoneleigh (PTY) LTD	Erf 14239
57	De Cock Famlie Trust	Erf 14743
58	Hans Trust	Erf 14565
59	Oppertune Trading 166 cc	Erf 13722
60	Propco Trust	Erf 13773

Below is an example of a letter sent to all affected property owners and organisations.

NOTICE OF LAND DEVELOPMENT APPLICATION TO INTERESTED AND AFFECTED PARTIES FOR COMMENT

Affected person's title: Mr./Mrs. Barends

Property Description: Erf 7013

The following land use application in terms of the Stellenbosch Land Use Planning Bylaw, 2023, refers:

Application Address: Erf 7001 Stellenbosch, Hendrikse Street, Coatesville, Stellenbosch

Applicant: Zutari, represented by Rudolf Schröder: rudolf.schröder@zutari.com

Owner: Stellenbosch Municipality, NPC Building, 1st Floor, c/o Ryneveld and Van Riebeeck Streets, Stellenbosch, 7600

Application Reference: LU/16572 and TP521/2023

Application Type: Application For Rezoning, Subdivision, Consent Use, Departure And Closure Of A Part of A Public Space Of Erf 7001 Stellenbosch, as detailed below.

Detailed description of land use or development proposal, including its intent and purpose:

- a) In terms of Section 15(2)(a) of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2023, for the rezoning of Erf 7001 Stellenbosch from "Public Open Space Zone" to a "subdivisional area" in order to allow for the following uses:
 - 201 Conventional Residential Zone Even
 - 5 Public Open Space Zone Even
 - 1 Utility Services Zone Erf
 - Public Roads
- b) In terms of Section 15(2)(b) of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2023, for a permanent departure:
 - to relax the parking requirements from 2 parking bays to 1 parking bay per dwelling house.
 - to relax the street building line from 2m [up to 250m²] and 3m [251m² to 500m²] to 1m and the common building lines from 1m to 0m for all residential zoned properties.
- c) In terms of Section 15(2)(d) of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2023, for the subdivision of Erf 7001 into 205 even, namely:
 - Erf 1 to Erf 201 (to be zoned Conventional Residential Zone) ranging from ±120m² to ±300m² (total of 3.5ha).
 - Erf 202 (±1945m²), Erf 203 (±548m²), Erf 204 (±261m²), Erf 205 (±5866m²) and Erf 206 (±8.4m²) to be zoned Public Open Space Zone;
 - Erf 207 (±1477m²) to be zoned Utility Services Zone.
 - Erf 208 (±17921m²) to be zoned Public Road and Parking Zone.
- d) In terms of Section 15(2)(n) of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2023, for the closure of a part of a public space (Erf 7001, Stellenbosch).
- e) In terms of Section 15(2)(o) of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2023, for consent use to erect a telecommunications mast on the portion to be zoned as Public Open Space Zone (Erf 205).

Notice is hereby given in terms of the provisions of the said Bylaw that the above-mentioned application has been submitted to the Stellenbosch Municipality for consideration. The

Figure 8: Example of letter sent to affected property owners

application is available for inspection on the Planning Portal of the Stellenbosch Municipal Website for the duration of the public participation process at the following address: <https://www.stellenbosch.gov.za/planning/documents/planning-notices/land-use-applications-advertisements>. If the website or documents cannot be accessed, an electronic copy of the application must be requested from the Applicant.

You are hereby invited to submit comments and / or objections on the application in terms of section 50 of the said bylaw. Written comment, which must include the reference to the application, the name, contact details and physical address of the person to submit the comments, the reasons for the comments, and the interest of the person who submits the comment in the application, may be submitted to the Applicant by electronic mail as follows: Zutari, attention Rudolf Schröder at rudolf.schröder@zutari.com. By lodging an objection, comment or representation, the person doing so acknowledges that information may be made available to the public and to the applicant.

The comments must be submitted within 30 days from the date of this notice to be received on or before the closing date of (26 February 2024). The Municipality, in terms of section 50(s) of the said Bylaw, may refuse to accept any comments; objection received after the closing date.

For any enquiries on the Application or the above requirements, or if you are unable to write and / or submit your comments as provided for, you may contact the Applicant for assistance at the e-mail address provided or telephonically at (+27 44 6055400) during normal office hours.

Yours faithfully

Rudolf Schröder Pr. Plr. A/151/2009
Professional Planner
Zutari (Pty) Ltd

Figure 9 Example of letter sent to affected property owners

PostNet: Stellenbosch Limited
Tel No: (021) 881 8884 Acc No: 37852
Sender's Copy
Barcode: 01442707870652

From: Stellenbosch Limited
Company Name: Stellenbosch Limited
Street Address: 4 Pine Street
Postcode: 7600
Country: South Africa
Email: info@st Stellenbosch.co.za

To: Recipient
Company Name: Stellenbosch Limited
Street Address: 4 Pine Street
Postcode: 7600
Country: South Africa
Email: info@st Stellenbosch.co.za

Postage: R 1.50
Insurance: R 1.50
Signature: R 1.50
Tracking: R 1.50
Total: R 6.00

PostNet Courier
To track your shipment go to: www.postnet.co.za or download the PostNet Courier App.

To view the Standard Conditions of Carriage online, please visit <http://www.postnet.co.za/standard-conditions-of-carriage>

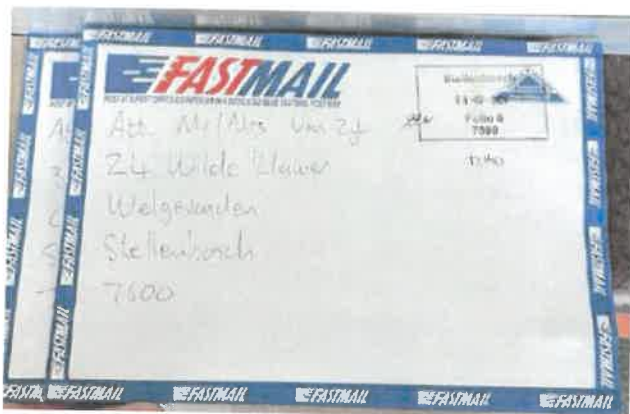


Figure 10: Proof of PostNet waybills

5.4 Notice to Community Organisations

A notice to request comments regarding the proposed rezoning and subdivision of Erf 7001 Stellenbosch was sent to interest groups/community organisation as prescribed by the Municipality. The following list was provided in letter of instruction to advertise (Section 41, which also include the addresses and contact details of the organisations.

- Stellenbosch Ratepayers Associations
- Stellenbosch Interest Group
- Stellenbosch Wine Routes
- Stellenbosch Agricultural Society

An example of the email that was sent is provided in figures below.

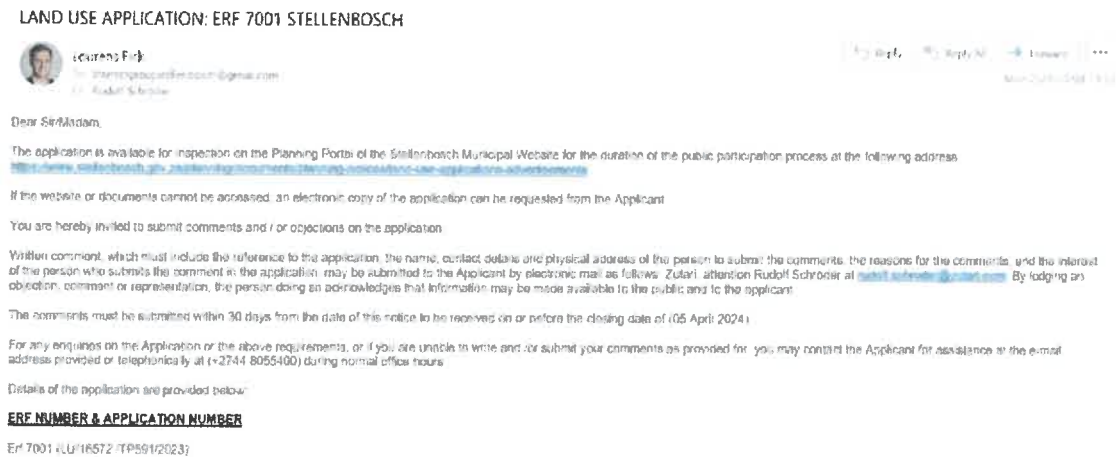


Figure 11: Example of email sent requesting comments from interest groups

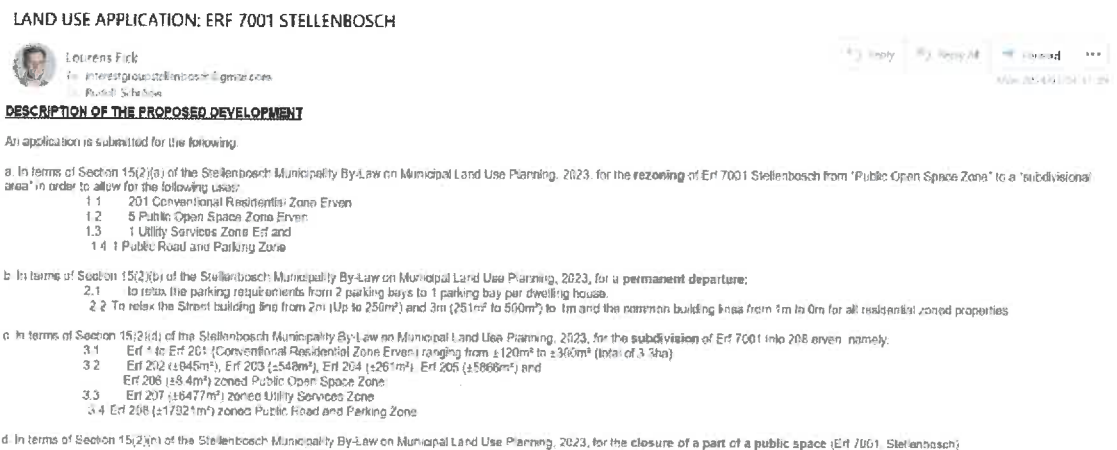


Figure 12: Example of email sent requesting comments from interest groups

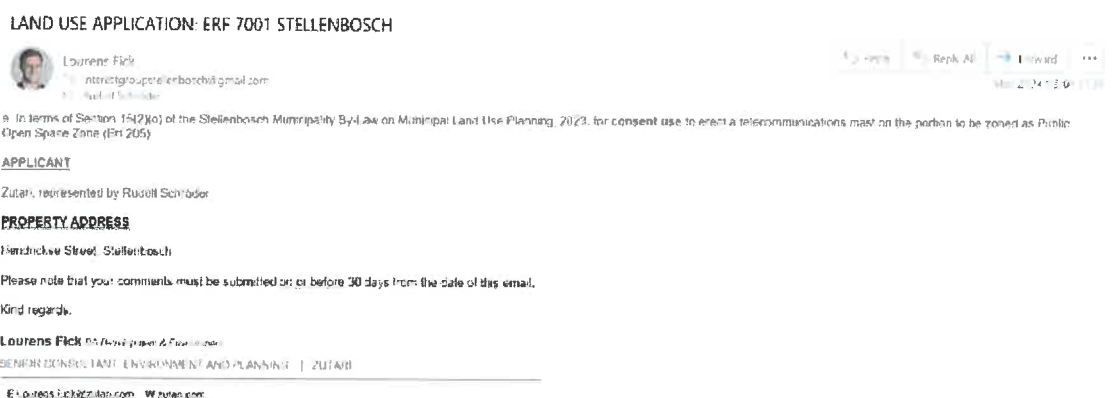


Figure 13: Example of email sent requesting comments from interest groups

5.5 Notices placed on Municipal Website

The notice of the proposed rezoning and subdivision was placed on the Municipal Website on 30 January 2024. Screenshots of the notice are provided below for reference.

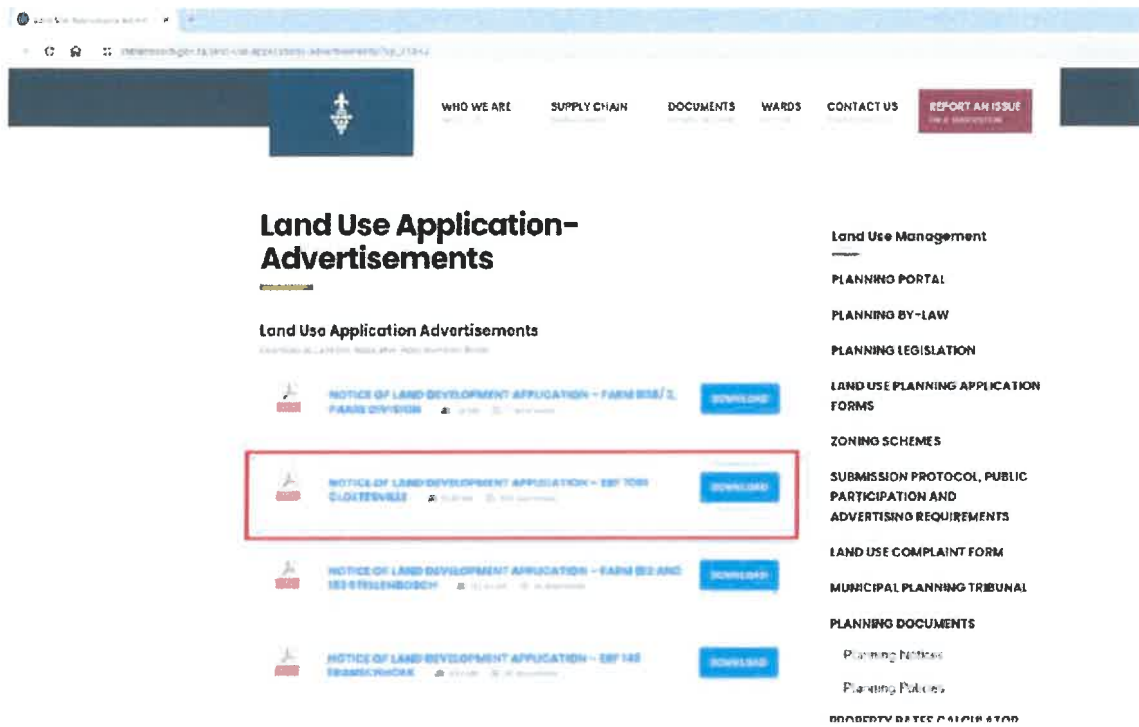


Figure 14: Screenshot of notice placed on municipal website

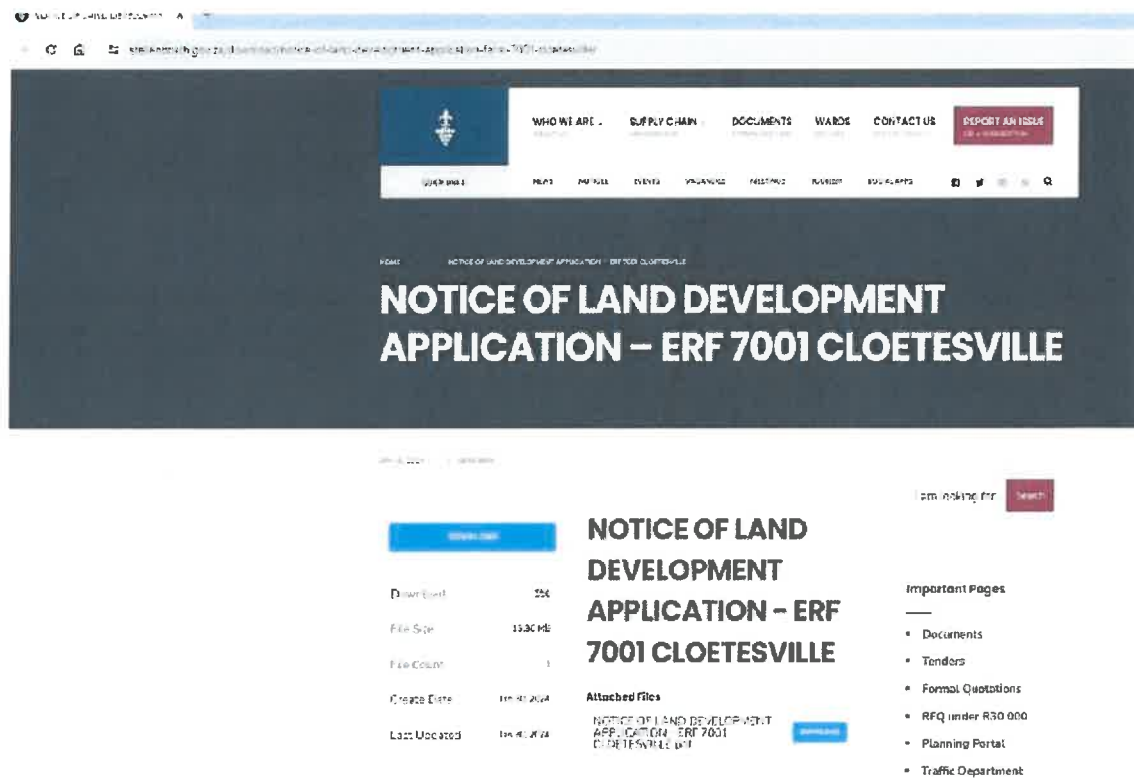


Figure 15: Screenshot of notice placed on municipal website

5.6 Request for comments from Ward Councillor

The Municipality requested comments from the Ward Councillor via email as per the below:

From: Bulelwa Mdoda <Bulelwa.Mdoda@ Stellenbosch.gov.za>
Sent: Wednesday, 24 January 2024 09:02
To: Peter Johnson
Cc: Shaun October; Bonita Klaasen; Carli Van Wyk; Rudolf Schröder; Lester Vanstavel
Subject: COMMENTS ON LAND USE APPLICATION: ERF 7001 STELLENBOSCH
Attachments: Mimecast Large File Send Instructions

You don't often get email from bulelwa.mdoda@ Stellenbosch.gov.za. [Learn why this is important](#)
 I'm using Mimecast to share large files with you. Please see the attached instructions.

Dear Councillor Johnson;

Attached please find the relevant documentation regarding the abovementioned application.

Kindly furnish me with your comment by email, in order to enable me to submit the application to the decision making authority for consideration.

FARM NUMBER & APPLICATION NUMBER

Erf 7001 (LU/16572 /TP591/2023)

DESCRIPTION OF THE PROPOSED DEVELOPMENT

An application is submitted for the following:

1. In terms of Section 15(2)(a) of the Stellenbosch Municipality By-Law on Municipal Land Use Planning, 2023, for the **rezoning** of Erf 7001 Stellenbosch from "Public Open Space Zone" to a "subdivisional area" in order to allow for the following uses:

- 1.1 201 Conventional Residential Zone Erven
- 1.2 5 Public Open Space Zone Erven
- 1.3 1 Utility Services Zone Erf and
- 1.4 1 Public Road and Parking Zone

Figure 16 - Email to Ward Councillor requesting comments

5.7 Compliance with Public Participation Requirements

In accordance with the requirements of the Land Use Planning Bylaw for Stellenbosch Municipality, 2023, the applicant hereby furnishes the Planning department with the following documents as proof that the public participation requirements have been met:

- Copies of the notice placed in the local newspaper;
- Proof that the notice was sent to Stellenbosch Municipality and that it was placed on the Municipal website;
- Proof that the site notice was displayed on the frontage of Erf 7001 Stellenbosch (Pictures taken in close proximity and from across the street);
- Proof of letters sent to affected property owners through PostNet delivery (copy of PostNet waybills);
- Proof of the notices sent to the interested/community groups.
- Filled in POE checklist and signed affidavit

The municipality requested comments from the Ward Councillor as outlined above.

6 Comments Received

A number of comments were received from the general public.

- 26 response / comments were received from members of the public in response to the application notice.
- 4 Interest groups

All comments received were grouped into categories of concerns or key issues to be addressed, as many of the comments received relate to the same aspect. Each area of concern is grouped into a main category, each with a number of sub-categories related to that main category.

Refer to Annexure A – Comment Tracker which is a consolidation of the comments received from the public as well as referral to sections in Public Participation Report where the comment has been addressed.

6.1 Categories of comments received from the public.

The below section provides an overview of the key issues raised from the comments received. Please find attached all comments received from the public as well as referral to sections in the Public Participation Report where the comment has been addressed, attached to this report as Annexure A.

The key issues raised during the public participation process have been categorised in the following **seven main categories**, each with its own **sub-category**.

Table 3 Main and sub-categories of comments received

	MAIN CATEGORY	SUB-CATEGORY
1.	Infrastructure and Urban Planning Concerns	<ul style="list-style-type: none"> ■ Parking Issues: Concerns about reduced parking bays exacerbating existing problems. ■ Overpopulation and Pressure on Infrastructure: Demands for assurances regarding water pressure, sewage systems, and waste management. Increased traffic congestion, noise pollution, and strain on existing infrastructure are anticipated ■ Building Regulations: Opposition to relaxing parking requirements and building lines.
2.	Security and Safety	<ul style="list-style-type: none"> ■ Crime and security concerns, as well as security measures: Inquiries about security protocols and access control for proposed developments. Requests for guarantees regarding security measures to prevent crime and unauthorized structures within the development
3.	Impact on Property Values	<ul style="list-style-type: none"> ■ Property Value: Residents express concerns about the potential devaluation of their properties due to the proposed development, including requests for assurances regarding property value retention The introduction of low-cost housing and high-density developments is seen as detrimental to the character and quality of the existing neighborhood.
4.	Affordable Housing and Social Impact	<ul style="list-style-type: none"> ■ Affordable Housing: Calls for a more balanced approach to housing development, with consideration for social integration

		<p>Suggestions to explore alternative locations for affordable housing developments that won't adversely affect property values.</p> <p>Concerns about the impact on the existing community's social fabric.</p>
5.	Traffic and Transportation	<ul style="list-style-type: none"> ■ Traffic Congestion: Concerns about increased traffic congestion and safety risks, especially in narrow streets and cul-de-sacs. Opposition to acceptable levels of service in traffic impact assessments. ■ Non-motorised Transport and Public Services: Calls for the development of pedestrian and non-motorized transport routes. Recommendations for upgrades to public transport facilities and services.
6.	Environmental Impact and Sustainability	<ul style="list-style-type: none"> ■ Concerns about the loss of open spaces, indigenous vegetation, and wildlife habitats (i.e., cape eagle owl colony) due to development. ■ Questions about the adequacy of environmental impact assessments and measures to mitigate ecological impact. ■ Concerns about the impact of a dam planned near residences (i.e., questions about mosquito presence, noise, and access to and maintenance the dam)
7.	Incomplete Application and Lack of Documentation	<ul style="list-style-type: none"> ■ Concerns are raised about the incomplete nature of the application, particularly regarding the lack of essential documentation (i.e., conveyancers' certificate and title deed)

The following section provides an overview of the key issues raised from the comments received, grouped per main category and sub-category, as well as a brief overarching response to each of the issues raised per sub-category.

6.1.1 MAIN CATEGORY: INFRASTRUCTURE AND URBAN PLANNING CONCERNS

6.1.1.1 Sub-category: Parking Concerns

The objections raised regarding parking concerns center on the proposed reduction in parking requirements per dwelling unit. Concerns primarily revolve around the anticipated high car ownership among residents of the proposed development. Many residents argue that the surrounding area already experiences significant traffic congestion, and reducing parking spaces would exacerbate the problem. Additionally, there are doubts about the feasibility of relying solely on public transportation options, particularly in areas with limited access to such services. Residents fear that inadequate parking provisions would result in vehicles being parked on streets, leading to further congestion, safety hazards, and potential increases in petty crimes.

Response:

Lowering parking requirements from 2 parking bays per unit to 1 parking bay per unit for a development of GAP housing or affordable housing in Cloeteville, Stellenbosch, is unlikely to cause a significant difference in traffic related issues primarily because of the intended target market. The Western Cape Provincial Inclusionary Housing Policy Framework defines affordable housing as the mismatch between what most households can afford versus the price most properties are available

for. The objective of the proposed development is to provide housing opportunities earmarked for the delivery of medium to upper (GAP) housing units, which is essentially households earning between R7000 and R22 000. Given the financial constraints of such households, it's reasonable to expect that many of them may own only one car, if any. Therefore, reducing the parking requirements aligns with the realistic needs of these households. Moreover, in densely populated areas like Cloeteville, promoting affordable housing with reduced parking requirements can incentivise the use of public transportation, cycling, and walking, thereby potentially reducing overall traffic congestion and promoting a more sustainable urban environment. Additionally, the freed-up space from reduced parking requirements is intended to optimize on the space of each unit to accommodate more outdoor space, therefore contributing to a more green and live-able development. Overall, the adjustment in parking requirements for affordable housing in Cloeteville is a pragmatic approach that considers the specific needs and circumstances of the intended target market while aiming to promote a more sustainable development.

6.1.1.2 Sub-category: Overpopulation and Pressure on Infrastructure

Residents have expressed significant concerns regarding the potential overpopulation resulting from the proposed development, highlighting various issues related to infrastructure strain. Specifically, demands have been made for assurances regarding water pressure, sewage systems, storm water management (e.g., due to increased run-off) and waste management. Residents fear that the increased population density will lead to a heightened demand for these essential services, potentially compromising their quality and reliability. A reoccurring concern was around the issue of water supply in Welgevonden due to periodic water pressure problems, related to the combined effect of low reservoir capacity, loadshedding, and inability of the reservoir feeder pumps and pipes to supply sufficient water to the reservoirs in between loadshedding cycles.

There were also concerns around the potential increase in the demand for schools due to the increased number of households that will be residing in the area. There is general belief that the existing schools in the area will not be sufficient to absorb the additional learners to be generated from the new development and therefore, provision must be made for additional education facilities.

Response:

The mandate of Stellenbosch Municipality regarding infrastructure maintenance and upgrading is fundamental to the well-being and development of the community. The municipality is responsible for the maintenance and upkeep of essential infrastructure such as roads, water supply systems, sewage systems, stormwater management, waste management, and public facilities. This includes regular inspections, repairs, and upgrades to ensure the reliability, safety, and efficiency of these systems. Additionally, the municipality is tasked with identifying and implementing necessary upgrades to meet the evolving needs of the growing population (i.e., the provision of education facilities in tandem with the Department of Education) and to address any deficiencies or vulnerabilities in the existing infrastructure. The issue raised are duly noted and the Municipality will take them into consideration. The civil engineers investigated the infrastructure requirements of the proposed development and concluded that no major issues are foreseen for the proposed development in terms of engineering services. Ample capacity is available for all civil services, given proposed upgrades are facilitated ahead of construction. Detail design will identify and address all other minor issues such as exact connection points and other construction details. All existing pipelines running through the site is considered in the layout design of the proposed development.

6.1.1.3 Sub-category: Building Regulations

The comments from stakeholders consistently oppose the relaxation of building lines in the proposed development. Opposition to relaxing building lines stems from fears of overcrowding, loss of privacy,

and environmental disruption. For example, one of residents highlighted that by changing building lines to fit in more houses and buildings, the direct result is overpopulation of the area which will lead to more pressure on the roads and infrastructure.

Response:

In response to concerns raised about the proposed relaxation of building lines in the development, it's crucial to clarify the intentions behind this choice. The aim is not to increase the number of units on the site but rather to optimise the layout of housing for three key purposes: spatial definition of the street, enhancing safety through surveillance, and creating more liveable spaces with larger garden areas. By adjusting building lines, we seek to create a sense of enclosure along streets, promote safety by increasing visibility, and provide residents with more outdoor space. Importantly, this relaxation will not alter the building footprint or floor area ratio (FAR) of each unit but is specifically designed to achieve the objectives as set out above. –

6.1.2 MAIN CATEGORY: SECURITY AND SAFETY

6.1.2.1 Sub-category: Crime and security concerns, as well as security measures

The comments express inquiries and requests for guarantees regarding security protocols and access control for the proposed development on Erf 7001. Concerned residents seek detailed information on the security measures that will be implemented to ensure the safety and well-being of current and future residents. They emphasize the importance of robust security protocols to prevent crime, vandalism, and unauthorised structures (i.e., informal settlements) within the development. Residents are particularly concerned about maintaining a secure boundary and managing access points to prevent unauthorized entry and safeguard the integrity of the neighbourhood. For instance, one of the residents mentioned that municipality has done nothing about structures being erected on the border wall and therefore request that servitudes be set up to prevent backyard structures from imposing on the property lines. They request assurances from developers and municipal authorities regarding the implementation of effective security measures, including surveillance systems, perimeter fencing, and security patrols, to address these concerns adequately.

Response:

The construction phase may pose an increased risk in crime in the surrounding area, which could be exacerbated by the duration of the construction phase, however this would not be much different from the risk posed by construction on any other site in the area. Even though the necessary measures will be taken to reduce the risk, it will not be possible to eliminate the risk entirely. Consideration should be given that inaction also presents a risk of illegal occupation or invasion of the site, which does not occur in a controlled manner and could also result in an increase in crime or compromise the safety in the area.

The proposed land uses are compatible with the surrounding existing land uses and therefore, no negative impacts on safety, health and well-being of the surrounding community are anticipated. The nature of the activities proposed in this development proposal promote pedestrian movement in the area and thus contributing to the safety of the area through increased surveillance.

Urban design and Design for Safety principles have been incorporated in the layout design. The principle of natural surveillance creates spaces with opportunities for encountering, engaging, and interacting with other people. If a space has "more eyes" coming and going, it can discourage a potential crime that is likely to occur in isolated locations. The current status of the site with lots of

vacant bushes and hiding places are therefore more prone to vagrants moving in and an increase in crime compared to a carefully designed urban space.

Application is only made to reduce the street and side building lines (not the back building lines): Application is made to reduce the standard building lines on all the Conventional Residential zoned erven to the following: street boundary building lines to 1 metre; the common boundary building lines (side building lines) to 0 metres. A reduction in the standard building lines will enable the various semi-detached or row housing units to be constructed and will enable the development to achieve the envisaged character described in the urban design framework. The concerns for pressure that will be placed on the existing boundary wall of the Welgevonden Estate is therefore groundless.

6.1.3 MAIN CATEGORY: IMPACT ON PROPERTY VALUES

6.1.3.1 Sub-category: Property Value

The issue of property value was widely cited by many residents that made submissions. Residents are deeply concerned about the potential impact of the proposed development on the value of their properties, highlighting fears of significant devaluation. It is perceived that the introduction of low-cost housing and high-density developments is viewed as a threat to the character and quality of the existing neighbourhood. Homeowners stress the importance of their properties as significant investments and express worries about the financial implications of any decrease in value. They seek assurances from developers and municipal authorities regarding measures to mitigate the risk of property devaluation and maintenance of the integrity of the neighbourhood's housing market. A suggestion made by one of the residents is to increase the price range of proposed units from R250 000 to only R750 000 to R250 000 to R2 million+ in order to promote income and housing mix, whilst mitigating the potential negative impact on property values.

Response:

These statements are unfounded and speculative. The notion that affordable housing developments inevitably lower nearby property values lacks empirical support and fails to consider the complexities of real estate markets. For instance, Sarah Holder's (2022) article "What Does Affordable Housing Do to Nearby Property Values?" published by Bloomberg offers valuable insights into this matter. Although Holder's article was written in the context of cities in America, the research holds merit due to the similar challenges experienced in subject areas of research. Holder's research involved a comprehensive analysis of multiple studies examining the relationship between affordable housing and property values across various regions and contexts. Her findings highlight that the impact of affordable housing on property values can vary significantly depending on local market conditions, neighbourhood dynamics, and the quality of the housing development. In many cases, affordable housing has been found to have neutral or even positive effects on nearby property values. Additionally, it's essential to recognise that property values are influenced by a multitude of factors beyond the presence of affordable housing, including availability of properties for sale or rent within a given area, investment potential, demographics, interest rates, and government policies. Therefore, attributing changes in property values solely to the introduction of affordable housing oversimplifies the intricate dynamics of the real estate market. The municipality is aiming to create a quality, well designed and vibrant urban development that will fit into the character of the area and should therefore enhance the area and not have a detrimental effect on surrounding property values.

6.1.4 MAIN CATEGORY: AFFORDABLE HOUSING AND SOCIAL IMPACT

6.1.4.1 Sub-category: Affordable Housing

The comments regarding affordable housing highlight a pressing need for a more balanced and thoughtful approach to housing development. While there is acknowledgment of the importance of providing housing for lower-income groups, there are widespread concerns about the proposed development's potential adverse effects on property values and the existing community's social fabric. Calls for exploring alternative locations for affordable housing, coupled with suggestions to ensure that developments are integrated into existing neighbourhoods without disrupting their character, underscore the importance of considering the broader social and economic impacts of such projects. Moreover, the objections emphasize the need for greater consultation with affected communities and stakeholders to address their concerns and ensure that any housing developments are sustainable, socially inclusive, and respectful of the diverse needs and aspirations of residents. In addition, some of the residents expressed the need to better understand the type of housing proposed on the site (i.e., low-cost housing vs affordable housing). Other sentiments shared by residents are ensuring that the housing units are retained for purposes of affordable housing as per the Inclusionary Housing Policy and are not sold off for financial gain as well as ensuring that preference is given to residents in nearby surrounding areas (i.e., Cloetesville).

Response:

The RFQ for the tender of the proposed development underscores a comprehensive vision aimed at addressing housing needs within a specific income bracket, targeting households earning between R7000 and R22,000. Beyond mere provision, the focus extends to ensuring that the design and overall aesthetic of the housing contribute positively to the broader community landscape, enriching the public image of the area. This entails not only creating visually appealing structures but also integrating them harmoniously with their surroundings.

Moreover, the development is guided by several key principles. Firstly, there's an emphasis on balance, meaning that the project seeks to navigate and reconcile various competing demands on the site, such as housing requirements, environmental considerations, and accessibility concerns. This balanced approach aims to ensure that the development meets the needs of its residents while also being sensitive to its impact on the environment and the local community.

Secondly, the concept of integration plays a vital role, with the development envisioned as seamlessly connected to its surrounding context. This involves the creation of a network of walkable streets that foster connectivity and encourage interaction with neighbouring areas. Additionally, efforts are made to promote links to public facilities, enhancing the overall accessibility and convenience for residents.

Lastly, resilience and flexibility are prioritised, reflecting a commitment to long-term sustainability and adaptability. This encompasses both the protection and preservation of natural systems and landscapes, as well as the creation of a robust framework that can accommodate future changes and evolving needs over time. By embracing these principles, the proposed development aims to not only provide housing but also foster a vibrant, inclusive, and sustainable community environment.

6.1.5 MAIN CATEGORY: TRAFFIC AND TRANSPORTATION

6.1.5.1 Sub-category: Traffic Congestion

The comments regarding traffic congestion highlight concerns among residents about the proposed development's impact on local roadways and safety. Concerns centre around the potential for

increased traffic volumes, particularly in narrow streets and cul-de-sacs, which are ill-equipped to handle additional vehicles. Residents express worry about gridlocks during peak hours, heightened noise levels, and safety risks for pedestrians, children, and pets. Moreover, there is opposition to the perceived inadequacy of traffic impact assessments and scepticism about whether proposed mitigating measures will effectively address the anticipated increase in traffic flow.

Response:

The Traffic Impact Assessment (TIA) dated 30 November 2023 includes the estimation of the trips that will be generated by developing the land. Identifying, modelling and discussing the impact the additional trips will have on the road network. The report also considers public transport, access routes, NMT and pedestrian activity. The impact on capacity and intersection operation was analysed using SIDRA Intersection modelling software. It was found that all the study intersections inside Cloetesville can operate at acceptable Levels of Service. All the future scenarios continue to operate at the same Levels of Service as the background traffic scenario. This is evidence that the delay and LOS issues at the key intersections are systemic and not as a result of the introduction of the development. Minor adjustments to the R304 intersection can improve the LOS for all approaches. The traffic impact assessment makes some recommendations as to what upgrades could be considered by the municipality to improve the level of services of the surrounding road network. From a traffic and transport point of view there is no reason for this infill housing project to not be approved. The additional traffic created by the development is not the cause of the failing intersection at the R44.

6.1.5.2 Sub-category: Non-motorised Transport and Public Services

These comments were centred around the pressing need for improvements in non-motorized transport infrastructure and public transport services to accommodate the proposed development adequately. Residents advocate for the development of pedestrian-friendly pathways and cycling routes to encourage alternative modes of transportation and reduce reliance on cars. They emphasise the importance of creating safe and accessible routes for pedestrians and cyclists, especially given the anticipated increase in traffic volumes. Furthermore, there are recommendations for upgrades to public transport facilities and services to provide viable alternatives for residents, particularly those without access to private vehicles.

Response:

The Traffic Impact Assessment (TIA) dated 30 November 2023 concludes that an increase in pedestrian activity can be expected on the Cloetesville road network, either as the main mode of transport or as a means of accessing public transport. The report makes some recommendations that could be considered by the municipality to make upgrades to the existing and required expansion of sidewalks along Hendrickse Road/Gabriels Road that links to Lang Street which is the main route for public transport within Cloetesville.

6.1.6 MAIN CATEGORY: ENVIRONMENTAL IMPACT AND SUSTAINABILITY

6.1.6.1 Sub-category: Environmental impact

The comments regarding environmental impact highlight profound concerns regarding the loss of open spaces, indigenous vegetation, and wildlife habitats due to the proposed development. Residents express apprehension about the potential displacement of a colony of Cape Eagle Owls and the

adverse effects on local biodiversity. Moreover, there are questions raised about the adequacy of environmental impact assessments and measures proposed to mitigate ecological impact. There is a clear sentiment that the development's footprint could significantly alter the natural landscape, potentially disrupting fragile ecosystems and diminishing the area's ecological resilience

Response:

An environmental due diligence study for Erf 7001, Cloetessville site was conducted by Guillaume Nel Environmental Consultants, to identify any potential environmental constraints that could impact on the developability of the site. Following the investigations, it was concluded that there are no environmental sensitive features on the site and have received confirmation from DEADP that the proposed development does not constitute any listed activities as defined in terms of the NEMA EIA Regulations 2014 (as amended) and that Environmental Authorisation is therefore not required prior to the proposed development. As many of the existing trees will be retained as possible which would then still provide a suitable habitat for birds.

6.1.6.2 Sub-category: impact of the planned stormwater detention pond

The comments regarding the planned stormwater detention pond were mainly centred around its maintenance and the lack of information about the proposal. Residents also expressed apprehension about the presence of stagnant water creating breeding grounds for mosquitoes. Overall, the key issue is around access to the dam and its maintenance, including who will be responsible for ensuring its upkeep and addressing any potential issues that may arise.

Response:

According to the Stellenbosch Municipality Design Guidelines and Minimum Standards for Civil Engineering Services Revision 0 June 2015, published by the mandated by the Department of Development Services and Project Management, Engineering Services Directorate, new residential developments are required to regulate the flow of stormwater between pre-development and post-development stages. To achieve this, a stormwater detention pond has been proposed on the site to further manage stormwater. Because the development is a Greenfield, the stormwater detention pond will have an outlet structure that will regulate the outflow of the pond to reduce the post-development flow rate to the pre-development flow rate. Furthermore, the detention pond is not intended for year-round retention of water but specifically for managing stormwater during the rainy season, thereby preventing the breeding of mosquitoes. To ensure safety, the embankments of the pond are designed with a gentle slope of 1:3, mitigating potential safety risks (i.e., drowning). In addition to stormwater management, the intention of the detention pond is to incorporate landscape features such as soft landscaping elements to enhance aesthetic quality and create a liveable space for residents to enjoy. With the respect to maintenance and upkeep, Stellenbosch Municipality is mandated to ensure that all public open space features are maintained. The proposed stormwater detention pond will therefore enhance the appearance of the development and forms an integral part of the functioning of the stormwater management strategy for the development.

6.1.7 MAIN CATEGORY: INCOMPLETE APPLICATION AND LACK OF DOCUMENTATION

6.1.7.1 Sub-category: Incomplete application

The comments highlight significant objections regarding the incomplete nature of the application, particularly concerning the absence of essential documentation required for proper assessment. Key concerns revolve around the failure to provide crucial information prescribed by municipal by-laws, such as copies of the title deed, conveyancers' certificates, and environmental impact assessments. This claimed omission raises doubts about the accuracy and reliability of the application's claims, potentially misleading interested and affected parties. The residents lamented that the absence of necessary documentation not only violates regulatory standards but also hampers the ability of stakeholders to make informed decisions and participate effectively in the consultation process.

Response:

A full application was submitted to the Stellenbosch Municipality on (date) in accordance with Section (38) which included the following:

- Completed and signed application form.
- a power of attorney (authorising the applicant to make the application on behalf of the owner)
- Title Deed as proof of registered ownership
- Written motivation for the application (including details of the property, proposed development, zoning certificate, environmental authorisation, Traffic Impact Assessment, services investigation, geotechnical conditions etc.)
- Subdivision Layout Plan
- Copy of the Surveyor-General's diagram of the property as well as a conveyancing certificate
- Locality plan

Subsequent to the submission, a letter of instruction to advertise dated 24 January 2024 was issued confirming the completion and acceptance of the application by the Municipality and granting permission for the application to be advertised in accordance with Section 41 of the Stellenbosch Municipality Land Use Management By-laws, 2023. The full application was made available to the public via the Municipality's website and the contact details of the consultant were made available for request of the application documentation.

6.2 Comments received from Municipal Departments.

The application was circulated to a number of municipal departments for comments. Comments from the below departments are attached. The municipality's internal departments are in support of the application (excluding the parking departure):

- Directorate: Infrastructure Services Civil Engineering Services - Manager: Development (Infrastructure Services) Tyrone King (5 August 2024)

"In consideration of provisions related to Civil Engineering Services the application (excluding the parking departure) is supported subject to conditions."

- Department: Community Services - Senior Environmental Planner: Schalk Van Der Merwe (5 August 2024)

"From an environmental planning point of view this department has no objection to the approval of the application"

- Electricity Services (26 February 2024)

"Recommended for approval"

See the comments attached as Annexure D.

7 Conclusion

The objective of this Public Participation Report is to outline the public participation and Stakeholder engagement process that was followed, following the submission of the application for the Rezoning and Subdivision of Erf 7001 Stellenbosch.

The public participation process followed was in strict compliance with the specifications of the Land Use Planning Bylaw for Stellenbosch Municipality, 2023.

This Public Participation report details the outcomes of the public participation process with all comments received, responses to comments as well as all correspondence to and from external departments. It is believed that any concerns raised by the public and stakeholders have been considered and have sufficiently been addressed. No comments have been received that warrants the proposed development to not proceed. The municipality's infrastructure department required some small amendments to the layout plan that have been made, and stated that the application for departure for a reduced parking requirement is not supported. The remainder of the application and land uses applied for are supported.

Annexure title

Annexure A – Comment Tracker

Annexure B - Comments Received from the Public

Annexure C – POE Checklist & Declaration

Annexure D – Comments Received from Municipal
Departments

In diversity there is beauty and
there is strength.

MAYA ANGELOU

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Feedback	Submitted by Name & Telephone	Interest Group/Organization	Contact details	Date of Comment	Details of Comments/Objections	Response Status
1	Merre Greeff		Email: [REDACTED]	25-Jan-24	<p>Tham in brochures what type of development is intended?</p> <p>PRINCE OF WALES SARIN FAMILI +278564070 SHEPHERD 28 January 2024. This is all your happy to give</p> <p>30-Jan-24 Application L1</p> <p>Tham in my opinion</p> <p>I am the owner of 14241, situated at 17 Belvedere, Welgemoed Estate</p> <p>I have studied your development plans and the effect it will have on the surrounding area. I feel that the same rules should apply as to the rest of the area. Welgemoed has already a parking problem, the same will happen to the new development if the parking is not increased. Most families have 2 breadwinners that need 2 cars to get to their workplace and have visitors that need parking.</p> <p>By changing building lines to fit in more houses and buildings will overpopulate the area and cause more pressure on the roads and infrastructure, and will also affect the surrounding neighbours with more noise.</p> <p>I object to the reducing of parking spaces from 2 parking bays to 1 parking bay per dwelling house.</p> <p>I object to the raising of street lighting poles and the street lighting poles.</p> <p>I would like to have more information about the plan that is planned right next to my house and the plan regarding the colour of Cape Ridge. One that lives in the trees behind our house will be an open body of water? What about mosquitoes? Who will have access to it and will it cause noise and disturbance?</p> <p>Gravel/Roadside</p> <p>Meridite</p> <p>31-Jan-24 Morning</p> <p>This will be for the exploration. Will there be security on the site to call if there are no residents? Currently, the Welgemoed Estate can be called when people make a noise behind our house or have a bad mood? The Welgemoed Estate is closed after hours, would there be a possibility to do the same?</p>	No response to required. Residents was responded to via email
2			Email: [REDACTED]	28 January 2024	<p>Tham in my opinion</p> <p>I am the owner of 14241, situated at 17 Belvedere, Welgemoed Estate</p> <p>I have studied your development plans and the effect it will have on the surrounding area. I feel that the same rules should apply as to the rest of the area. Welgemoed has already a parking problem, the same will happen to the new development if the parking is not increased. Most families have 2 breadwinners that need 2 cars to get to their workplace and have visitors that need parking.</p> <p>By changing building lines to fit in more houses and buildings will overpopulate the area and cause more pressure on the roads and infrastructure, and will also affect the surrounding neighbours with more noise.</p> <p>I object to the reducing of parking spaces from 2 parking bays to 1 parking bay per dwelling house.</p> <p>I object to the raising of street lighting poles and the street lighting poles.</p> <p>I would like to have more information about the plan that is planned right next to my house and the plan regarding the colour of Cape Ridge. One that lives in the trees behind our house will be an open body of water? What about mosquitoes? Who will have access to it and will it cause noise and disturbance?</p>	No response to required. Residents was responded to via email
3	Prof Muelis Stander		Email: [REDACTED]	30-Jan-24	<p>Tham in my opinion</p> <p>I am the owner of 14241, situated at 17 Belvedere, Welgemoed Estate</p> <p>I have studied your development plans and the effect it will have on the surrounding area. I feel that the same rules should apply as to the rest of the area. Welgemoed has already a parking problem, the same will happen to the new development if the parking is not increased. Most families have 2 breadwinners that need 2 cars to get to their workplace and have visitors that need parking.</p> <p>By changing building lines to fit in more houses and buildings will overpopulate the area and cause more pressure on the roads and infrastructure, and will also affect the surrounding neighbours with more noise.</p> <p>I object to the reducing of parking spaces from 2 parking bays to 1 parking bay per dwelling house.</p> <p>I object to the raising of street lighting poles and the street lighting poles.</p> <p>I would like to have more information about the plan that is planned right next to my house and the plan regarding the colour of Cape Ridge. One that lives in the trees behind our house will be an open body of water? What about mosquitoes? Who will have access to it and will it cause noise and disturbance?</p>	Issues/concerns raised have been addressed/responded to under the following section of the Public Participation Report: Section 6.1.1 sub-category 6.1.1.1 and sub-category 6.1.1.3 Section 6.1.2 sub-category 6.1.2.1, sub-category 6.1.2.2
4			Email: [REDACTED]	31-Jan-24	<p>Tham in my opinion</p> <p>I am the owner of 14241, situated at 17 Belvedere, Welgemoed Estate</p> <p>I have studied your development plans and the effect it will have on the surrounding area. I feel that the same rules should apply as to the rest of the area. Welgemoed has already a parking problem, the same will happen to the new development if the parking is not increased. Most families have 2 breadwinners that need 2 cars to get to their workplace and have visitors that need parking.</p> <p>By changing building lines to fit in more houses and buildings will overpopulate the area and cause more pressure on the roads and infrastructure, and will also affect the surrounding neighbours with more noise.</p> <p>I object to the reducing of parking spaces from 2 parking bays to 1 parking bay per dwelling house.</p> <p>I object to the raising of street lighting poles and the street lighting poles.</p> <p>I would like to have more information about the plan that is planned right next to my house and the plan regarding the colour of Cape Ridge. One that lives in the trees behind our house will be an open body of water? What about mosquitoes? Who will have access to it and will it cause noise and disturbance?</p>	Issues/concerns raised have been addressed/responded to under the following section of the Public Participation Report: Section 6.1.2 sub-category 6.1.2.1 Section 6.1.1 sub-category 6.1.1.1 Section 6.1.3 sub-category 6.1.3.2
5	Johan Jansen van Vuuren		Email: [REDACTED]	01-Feb-24	<p>Tham in my opinion</p> <p>I am the owner of 14241, situated at 17 Belvedere, Welgemoed Estate</p> <p>I have studied your development plans and the effect it will have on the surrounding area. I feel that the same rules should apply as to the rest of the area. Welgemoed has already a parking problem, the same will happen to the new development if the parking is not increased. Most families have 2 breadwinners that need 2 cars to get to their workplace and have visitors that need parking.</p> <p>By changing building lines to fit in more houses and buildings will overpopulate the area and cause more pressure on the roads and infrastructure, and will also affect the surrounding neighbours with more noise.</p> <p>I object to the reducing of parking spaces from 2 parking bays to 1 parking bay per dwelling house.</p> <p>I object to the raising of street lighting poles and the street lighting poles.</p> <p>I would like to have more information about the plan that is planned right next to my house and the plan regarding the colour of Cape Ridge. One that lives in the trees behind our house will be an open body of water? What about mosquitoes? Who will have access to it and will it cause noise and disturbance?</p>	Issues/concerns raised have been addressed/responded to under the following section of the Public Participation Report: Section 6.1.2 sub-category 6.1.2.1 Section 6.1.1 sub-category 6.1.1.1 Section 6.1.3 sub-category 6.1.3.2
6	Elis September		Email: [REDACTED]	01-Feb-24	<p>Tham in my opinion</p> <p>I am the owner of 14241, situated at 17 Belvedere, Welgemoed Estate</p> <p>I have studied your development plans and the effect it will have on the surrounding area. I feel that the same rules should apply as to the rest of the area. Welgemoed has already a parking problem, the same will happen to the new development if the parking is not increased. Most families have 2 breadwinners that need 2 cars to get to their workplace and have visitors that need parking.</p> <p>By changing building lines to fit in more houses and buildings will overpopulate the area and cause more pressure on the roads and infrastructure, and will also affect the surrounding neighbours with more noise.</p> <p>I object to the reducing of parking spaces from 2 parking bays to 1 parking bay per dwelling house.</p> <p>I object to the raising of street lighting poles and the street lighting poles.</p> <p>I would like to have more information about the plan that is planned right next to my house and the plan regarding the colour of Cape Ridge. One that lives in the trees behind our house will be an open body of water? What about mosquitoes? Who will have access to it and will it cause noise and disturbance?</p>	Issues/concerns raised have been addressed/responded to under the following section of the Public Participation Report: Section 6.1.2 sub-category 6.1.2.1 Section 6.1.1 sub-category 6.1.1.1 Section 6.1.3 sub-category 6.1.3.2
7	Dean Phillips		Email: [REDACTED]	05-Feb-24	<p>Tham in my opinion</p> <p>I am the owner of 14241, situated at 17 Belvedere, Welgemoed Estate</p> <p>I have studied your development plans and the effect it will have on the surrounding area. I feel that the same rules should apply as to the rest of the area. Welgemoed has already a parking problem, the same will happen to the new development if the parking is not increased. Most families have 2 breadwinners that need 2 cars to get to their workplace and have visitors that need parking.</p> <p>By changing building lines to fit in more houses and buildings will overpopulate the area and cause more pressure on the roads and infrastructure, and will also affect the surrounding neighbours with more noise.</p> <p>I object to the reducing of parking spaces from 2 parking bays to 1 parking bay per dwelling house.</p> <p>I object to the raising of street lighting poles and the street lighting poles.</p> <p>I would like to have more information about the plan that is planned right next to my house and the plan regarding the colour of Cape Ridge. One that lives in the trees behind our house will be an open body of water? What about mosquitoes? Who will have access to it and will it cause noise and disturbance?</p>	Issues/concerns raised have been addressed/responded to under the following section of the Public Participation Report: Section 6.1.2 sub-category 6.1.2.1 Section 6.1.1 sub-category 6.1.1.1 Section 6.1.3 sub-category 6.1.3.2

8	Gavin Davidson	09 Feb 24 14:00 Email:  10:29	<p>Sorry for the delayer reply with regards to this application question</p> <p>Firstly, Stalinskoch is already so congested when it comes to the traffic, and this will only make things worse.</p> <p>Secondly, we have limited schools in Stalinskoch also and this application will also add to that strain.</p> <p>Thirdly, there is several other developments happening just outside Chloestville / Weigoworden area which will also have more impact on the current traffic strain.</p> <p>Then lastly in this application there is no mentioning of what type of housing project this will be.</p>	Issues/concerns raised have been addressed/responded to under the following section of the Public Participation Report: Section 6.1.4, sub-category 6.1.4.1 Section 6.1.1, sub-category 6.1.1.2 In addition the motivation memorandum that was made publicly available states to type of development/housing.
9	Jaco de Kock	15 Feb 24 17:00 Email: 	<p>Good day Rudoof,</p> <p>The "Unit use application: 277001, stalinssch" as well as our telephone conversation refers.</p> <p>I am writing in collaboration with the owner of property in Weigoworden street, Weigoworden which borders the proposed area for development as referred to in the application above. The owner is Alwyn van der Merwe - Cced in the email. I also represent myself and other owners in Weigoworden estate.</p> <p>I understand that as part of the Stand Planning process for this application, there is an opportunity for public participation to discuss and highlight specific issues, concerns as well as proposals for a win-win for the entire surrounding community.</p> <p>I would like to use the opportunity to highlight a few matters we wish that request if you can facilitate a meeting on our behalf with Stalinskoch housing as soon as possible.</p> <p>1. We understand that there is a housing shortage and that the Municipality has thereby facilitated a need for possible "mixed development".</p> <p>2. We would like to discuss the options of layout of the plots and streets as well as a green area - with reference to the 4 options in the application document. We do want to understand and see what the Municipality has in mind for the future security and safety of the area.</p> <p>3. The Weigoworden owners want to highlight the security risk on the border to Weigoworden. Along with this, we want to discuss proposals which conditions can be set in place to ensure the security of the area.</p> <p>4. We are also concerned about the layout and use of the area.</p> <p>Regarding point 3 above, we as Weigoworden owners want to make sure that the Estate's security is not weakened or exposed.</p> <p>During area development, the boundary walls and dwellings will be directly exposed to construction workers and we would like to request Housing to take preventive action and ensure the security of the area.</p> <p>After completion of construction work, it is also important that Housing bring some proposals that ensure continuous security, border monitoring, interdevelopment etc.</p> <p>For example, border wall or gate enlarged if needed. More cameras etc etc.</p> <p>Border security, we also specifically want to understand whether "run off" and the drainage system between the plots that border the Weigoworden properties. However, the run-off and drainage must not contribute to drainage outside properties.</p> <p>Rudoof, I trust the above are already some conditions and proposals that I hope and trust Housing will take into account the needs and concerns of all adding communities.</p>	Issues/concerns raised have been addressed/responded to under the following section of the Public Participation Report: Section 6.1.2, sub-category 6.1.2.1 Section 6.1.3, sub-category 6.1.3.2
10	DUPRI COMBARDO Valeria Wachs Development Management Consultants and Environmental Assessment Practitioners (On behalf of the Weigoworden Home Owners' Association (WHOA))	15 Feb 24 Email: 	<p>The comment is submitted on behalf of the Weigoworden Home Owners' Association (WHOA) that represents all the owners of the plots and the interested and same municipal services infrastructure. As an initial statement, the WHOA wants to make it clear that it is not opposed to the human settlement development and the provision of affordable housing opportunities for the residents of the Stalinskoch area and is in particular for Chloestville residents who have not had access to such opportunities. There are however a number of concerns that the WHOA would like to comment on and make certain requests relating to the development proposal to ensure that the development is in the best interests of the community.</p> <p>A. Human settlement</p> <p>a. Nature of the development: The WHOA specifically does not object to the development of affordable housing where properties are intended for disposal to qualifying purchasers. However, the WHOA is concerned that the development is not suitable for full housing subsidies, i.e. more than the minimum household income of R3 500.00 per month and would make use of the so-called first home finance (FFP) scheme. The WHOA will object to and oppose the proposed development.</p> <p>b. Repetition of benefits: The Municipality should introduce the measures contained in the approved Incentivized Housing Policy to ensure that the housing is realized as an affordable housing project. The WHOA is concerned that the development is not suitable for full housing subsidies, i.e. more than the minimum household income of R3 500.00 per month and would make use of the so-called first home finance (FFP) scheme. The WHOA will object to and oppose the proposed development.</p> <p>c. Effect on the surrounding area: The WHOA is concerned that the development is not suitable for full housing subsidies, i.e. more than the minimum household income of R3 500.00 per month and would make use of the so-called first home finance (FFP) scheme. The WHOA will object to and oppose the proposed development.</p> <p>d. Effect on the surrounding area: The WHOA is concerned that the development is not suitable for full housing subsidies, i.e. more than the minimum household income of R3 500.00 per month and would make use of the so-called first home finance (FFP) scheme. The WHOA will object to and oppose the proposed development.</p> <p>e. Effect on the surrounding area: The WHOA is concerned that the development is not suitable for full housing subsidies, i.e. more than the minimum household income of R3 500.00 per month and would make use of the so-called first home finance (FFP) scheme. The WHOA will object to and oppose the proposed development.</p> <p>f. Effect on the surrounding area: The WHOA is concerned that the development is not suitable for full housing subsidies, i.e. more than the minimum household income of R3 500.00 per month and would make use of the so-called first home finance (FFP) scheme. The WHOA will object to and oppose the proposed development.</p> <p>g. Effect on the surrounding area: The WHOA is concerned that the development is not suitable for full housing subsidies, i.e. more than the minimum household income of R3 500.00 per month and would make use of the so-called first home finance (FFP) scheme. The WHOA will object to and oppose the proposed development.</p> <p>h. Effect on the surrounding area: The WHOA is concerned that the development is not suitable for full housing subsidies, i.e. more than the minimum household income of R3 500.00 per month and would make use of the so-called first home finance (FFP) scheme. The WHOA will object to and oppose the proposed development.</p> <p>i. Effect on the surrounding area: The WHOA is concerned that the development is not suitable for full housing subsidies, i.e. more than the minimum household income of R3 500.00 per month and would make use of the so-called first home finance (FFP) scheme. The WHOA will object to and oppose the proposed development.</p> <p>j. Effect on the surrounding area: The WHOA is concerned that the development is not suitable for full housing subsidies, i.e. more than the minimum household income of R3 500.00 per month and would make use of the so-called first home finance (FFP) scheme. The WHOA will object to and oppose the proposed development.</p> <p>k. Effect on the surrounding area: The WHOA is concerned that the development is not suitable for full housing subsidies, i.e. more than the minimum household income of R3 500.00 per month and would make use of the so-called first home finance (FFP) scheme. The WHOA will object to and oppose the proposed development.</p> <p>l. Effect on the surrounding area: The WHOA is concerned that the development is not suitable for full housing subsidies, i.e. more than the minimum household income of R3 500.00 per month and would make use of the so-called first home finance (FFP) scheme. The WHOA will object to and oppose the proposed development.</p> <p>m. Effect on the surrounding area: The WHOA is concerned that the development is not suitable for full housing subsidies, i.e. more than the minimum household income of R3 500.00 per month and would make use of the so-called first home finance (FFP) scheme. The WHOA will object to and oppose the proposed development.</p> <p>n. Effect on the surrounding area: The WHOA is concerned that the development is not suitable for full housing subsidies, i.e. more than the minimum household income of R3 500.00 per month and would make use of the so-called first home finance (FFP) scheme. The WHOA will object to and oppose the proposed development.</p> <p>o. Effect on the surrounding area: The WHOA is concerned that the development is not suitable for full housing subsidies, i.e. more than the minimum household income of R3 500.00 per month and would make use of the so-called first home finance (FFP) scheme. The WHOA will object to and oppose the proposed development.</p> <p>p. Effect on the surrounding area: The WHOA is concerned that the development is not suitable for full housing subsidies, i.e. more than the minimum household income of R3 500.00 per month and would make use of the so-called first home finance (FFP) scheme. The WHOA will object to and oppose the proposed development.</p> <p>q. Effect on the surrounding area: The WHOA is concerned that the development is not suitable for full housing subsidies, i.e. more than the minimum household income of R3 500.00 per month and would make use of the so-called first home finance (FFP) scheme. The WHOA will object to and oppose the proposed development.</p> <p>r. Effect on the surrounding area: The WHOA is concerned that the development is not suitable for full housing subsidies, i.e. more than the minimum household income of R3 500.00 per month and would make use of the so-called first home finance (FFP) scheme. The WHOA will object to and oppose the proposed development.</p> <p>s. Effect on the surrounding area: The WHOA is concerned that the development is not suitable for full housing subsidies, i.e. more than the minimum household income of R3 500.00 per month and would make use of the so-called first home finance (FFP) scheme. The WHOA will object to and oppose the proposed development.</p> <p>t. Effect on the surrounding area: The WHOA is concerned that the development is not suitable for full housing subsidies, i.e. more than the minimum household income of R3 500.00 per month and would make use of the so-called first home finance (FFP) scheme. The WHOA will object to and oppose the proposed development.</p> <p>u. Effect on the surrounding area: The WHOA is concerned that the development is not suitable for full housing subsidies, i.e. more than the minimum household income of R3 500.00 per month and would make use of the so-called first home finance (FFP) scheme. The WHOA will object to and oppose the proposed development.</p> <p>v. Effect on the surrounding area: The WHOA is concerned that the development is not suitable for full housing subsidies, i.e. more than the minimum household income of R3 500.00 per month and would make use of the so-called first home finance (FFP) scheme. The WHOA will object to and oppose the proposed development.</p> <p>w. Effect on the surrounding area: The WHOA is concerned that the development is not suitable for full housing subsidies, i.e. more than the minimum household income of R3 500.00 per month and would make use of the so-called first home finance (FFP) scheme. The WHOA will object to and oppose the proposed development.</p> <p>x. Effect on the surrounding area: The WHOA is concerned that the development is not suitable for full housing subsidies, i.e. more than the minimum household income of R3 500.00 per month and would make use of the so-called first home finance (FFP) scheme. The WHOA will object to and oppose the proposed development.</p> <p>y. Effect on the surrounding area: The WHOA is concerned that the development is not suitable for full housing subsidies, i.e. more than the minimum household income of R3 500.00 per month and would make use of the so-called first home finance (FFP) scheme. The WHOA will object to and oppose the proposed development.</p> <p>z. Effect on the surrounding area: The WHOA is concerned that the development is not suitable for full housing subsidies, i.e. more than the minimum household income of R3 500.00 per month and would make use of the so-called first home finance (FFP) scheme. The WHOA will object to and oppose the proposed development.</p>	Responses to the comments raised have been addressed within the designated sections of the Public Participation Report, as outlined below. -Section 6.1.3, sub-category 6.1.3.1 -Section 6.1.3, sub-category 6.1.3.2 and 6.1.4.2 -Section 6.1.3, sub-category 6.1.3.2 -Section 6.1.3, sub-category 6.1.3.2 Additionally, supplementary responses have been provided to address other raised issues: -According to the Municipal Incentivized Housing Policy, homeowners retain the right to sell their property, but sales should align with the income range set by the relevant study (2022) highlights a notable shortage of affordable housing in Chloestville. The proposed residential units are primarily to accommodate Chloestville residents. -The Western Cape Demand Study (2022) highlights a notable shortage of affordable housing in Chloestville. The proposed residential units are primarily to accommodate Chloestville residents. -Comments regarding layout considerations have been duly noted and will be carefully reviewed. -Acknowledgment is given to the proposal for a servitude. However, implementing a servitude to restrict second dwelling construction conflicts with the Municipality's goal of increasing housing density and addressing the housing shortage in Chloestville. -The recommendation to plant trees will be taken into account by the municipality. Additionally, to preserve existing trees, a public open space has been included in the plans.
11	Willem van Wierden Barnard	21 Feb 24 Email: 	<p>Accept my objection in relation to the new development, (277001), Weigoworden Chloestville, Stellenbosch.</p> <p>1. The above development will have an impact in relation to our property.</p> <p>2. The traffic will increase.</p> <p>3. Structure to be built on plots where people can still live (weedy houses etc).</p> <p>Can you confirm whether the above plot will develop into a square camp? Many areas with this type of development currently look like a square camp.</p> <p>The residents at Weigoworden are unhappy with the development and we have everyone's support.</p> <p>Thank you.</p> <p>Willem van Wierden Barnard 081 641 8636 / 081 967 6265.</p>	The objection is duly noted, issues/concerns raised have been addressed/responded to under the following section of the Public Participation Report: Section 6.1.3, sub-category 6.1.3.1 Section 6.1.3, sub-category 6.1.3.2 Section 6.1.4, sub-category 6.1.4.1

Rudolf Schröder

From: Devin Smyth <[REDACTED]>
Sent: Thursday, 22 February 2024 17:22
To: Rudolf Schröder
Subject: Objection to the proposed development on erf 7001

You don't often get email from smyth.devin@gmail.com. [Learn why this is important](#)
Good day.

I write this email to Object to the proposed plan to rezone and develop erf 7001.

As a resident of Welgevonden, I believe such a project would be detrimental to the interests of current residents.

Kindest regards

Devin Smyth

Rudolf Schröder

From: Dupré Lombaard (Virdus Works) <dupre.lombaard@virdus.com>
Sent: Monday, 19 February 2024 08:39
To: Rudolf Schröder
Cc: Gawie Marx; Anneke Du Toit
Subject: COMMENT ON THE LAND DEVELOPMENT APPLICATION: ERF 7001, STELLENBOSCH (CLOETESVILLE HOUSING DEVELOPMENT)
Attachments: Comment obo Welgevonden HOA to Ida Erf 7001 Stellenbosch.pdf

You don't often get email from dupre.lombaard@virdus.com. [Learn why this is important](#)

Dear Rudolph

The attached comment is submitted on behalf of the Welgevonden Home Owners' Association (WHOA). It represents abutting land owners to the north of the application property and proposed development site.

Please acknowledge receipt of the submission.

Regards / Groete / Saludos

DUPRÉ LOMBAARD

(SACPLAN B/8076/1998 / EAPASA 2019/304)

Mobile: South Africa +27 82 895 6362 // Spain +34 660 48 24 46

Address: Rúa Clara Campoamor 2, Piso 2 E, Santa Uxia de Ribeira, 15968, La Coruña, Spain

Virdus Works (Pty) Ltd (Reg. No. 2018/585747/07)

Development Management Consultants and Environmental Assessment Practitioners

Address: 3rd Floor, Time Square, Elektron Street, Techno Park, Stellenbosch, 7600, South Africa

Web: www.virdus.com

Rudolf Schröder

From: [REDACTED]
Sent: Saturday, 03 February 2024 18:59
To: Rudolf Schröder
Subject: ERF 7001 CLOETESVILLE VERWYSING LU/16572, TP591/2023 MY ERF 7014 HENDRICKSESTRAAT 15

You don't often get email from elie.september54@gmail.com. [Learn why this is important](#)

Goeie dag Meester

Stellenbosch Munisipaliteit is vir die tweede keer besig om 'n dooie perd op te saal. Ek verwys na jul antwoord op jul eerste berig in die Eikestadnuus van 8 November 2020.

Kennisgewing 63/2020 destyds het duidelik gestel "*Background To specifically address the needs of the backyarders residing primarily in privately owned properties*" Julle advertensie bly dieselfde net met 'n ander sous.

Julle praat nou van CAB housing om geleentheid te skep vir individue/families wat nie kan bekostig om behuising in die ope mark te bekom nie. Julle stel dit ook duidelik dat geen laekostebehuising op hierdie perseel beplan word nie. Die inpak sal minimaal wees vir wie. Die huise sal die omgewing komplementeer. Goeie antwoord op papier maar wie gaan monitor of uitvoering daaraan gegee gaan word. Kyk na jul pogings by The Steps en Orleans Lounge. Pateties. Ons word geteister deur misdaad wat nou net vererger gaan word.

My beswaar en voorstelle

- Erf 7001 is nie geskik vir behuising nie omdat waterpypleidings na en van die erf loop.
- Die erf langs Cloeteville laer sou meer geskik wees vir Cloeteville inwoners.
- Indien die huise wel opgerig word moet daar 'n voorwaarde wees dat geen los strukture soos Wendy huise op die erf opgerig mag word nie.
- Die voorste omheinings moet dieselfde wees om te verhoed dat bestaande waardasies daal en moet deel wees van die oorspronklike beplanning. Dit is hartseer dat die beste straat in Cloeteville met sy baie pensioenarisse nou getakel word.
- Die kleur van die dakke en buite mure moet dieselfde wees.
- Voorkeur aan Cloeteville inwoners.
- Nerens in jul skrywes het julle melding gemaak watter tipe huise gebou sal word nie. Selfs mnr Van Stavel is stil hieroor.
- Ongelukkig is dit so dat nie geen van jul beplanners in Stellenbosch bly nie. Dit is jammer.

Vriendelike groete

Elie September

IAH : Dip Finansiële Rekeningkunde
 IAH : Dip Sake Bestuur
 Nas. Dip: Plaaslike Owerheidsfinansies
 B Tech: Plaaslike Owerheidsfinansies

Elie September

IAH : Dip Finansiële Rekeningkunde
 IAH : Dip Sake Bestuur
 Nas. Dip: Plaaslike Owerheidsfinansies
 B Tech: Plaaslike Owerheidsfinansies

Scanned with

BESWAAR TEEN DIE ONTWIKKELING VAN ERF 7001 BEKEND AS
SOEKMEKAAR CLOETESVILLE

Ons dien beswaar aan namens die inwoners van Hendrickse, Rhode
en Gabrielstraat oor die voorgestelde ontwikkeling.

Die hoofbesware is die volgende:

- Verlaging van ons eiedomme se waardasies
- Voorgenome ontwikkeling sal ons strate in 'n plakkerskamp omskep
- Erwe van 120 vierkante meter sal die eienaar wat dit bewoon of huur verplig om onwettige strukture aan te bou om te bewoon
- Dit sal ons omgewing wat reeds bedrywig is met nog meer verkeer en onwelkome werklose persone laat met die gepaardgaande inbrake.

Aangeheg vind u 'n lys van eienaars se staatliggings en
handtekeninge.

2024/02/23

Kantak WJ Barends



Huisaenamer.	Adress	Hendtekan
MP Beukes	Hendricksestraat 2	MP Beukes
F. SEPTEMBER	HENDRICKSTRAAT 4	<i>[Signature]</i>
M. CHRISTIAN	WILLIAMS STR. 49.	<i>[Signature]</i>
Darbene Vrij	William str 47	<i>[Signature]</i>
Ivella Petersen	Hendrickse str. 5	<i>[Signature]</i>
Joan M. RHEE	Hendrickse Str 11	<i>[Signature]</i>
Pieter Joddie	13 Hendrickse Cloeksville	<i>[Signature]</i>
E. September	15 Hendrickse str	<i>[Signature]</i>
W.J. Barends.	17 HENDRICKSE	<i>[Signature]</i>
G. JAVIJS	26 RHODE STRAAT	<i>[Signature]</i>
G. SMITH	41 RHODE STRAAT	<i>[Signature]</i>
F. Cornelisan	23 Hendrickse Str.	<i>[Signature]</i>
T. SAMUELS	25 Hendricksestraat	<i>[Signature]</i>
L. S. CONDS	27 Hendrickse	<i>[Signature]</i>
H. ZIMONSKI	29 HENDRICKSE	<i>[Signature]</i>
L. Appolis	31 Hendrickse. Street.	<i>[Signature]</i>
M. FAREO	33 Hendrickse straat	<i>[Signature]</i>
Frank Bucciturneri	35 HENDRICKSE STRAAT	<i>[Signature]</i>
Charlton FRANS	37 HENDRICKSE STRAAT	<i>[Signature]</i>
M. Siebrige	39 Hendricksestraat 59	<i>[Signature]</i>
McCasal	39 Hendrickse str 39	<i>[Signature]</i>
G. Casal	39 Hendrickse str STR	<i>[Signature]</i>
Ruthy Rhode	41 Hendrickse	<i>[Signature]</i>
Wendy U. David	49 Gabriellstr	<i>[Signature]</i>
S. Oliver	41 HENDRICKSE	<i>[Signature]</i>
Ray Purisloo	49 Hendrickse / 54 February 21	<i>[Signature]</i>

Huisaenoot.	Adres	Handteken
MP Beukes	Hendricksestraat 2	MP Beukes
F. SEPTEMBER	HENDRICKSTRAAT 4	<i>[Signature]</i>
M. CHRISTIAN	WILLIAMS STR. 49.	<i>[Signature]</i>
Dorlene Visser	Williamstr 47	<i>[Signature]</i>
Tvetic Petersen	Hendricksestr. 5	<i>[Signature]</i>
Bram de RHEDE	Hendrickse Str 11	<i>[Signature]</i>
Pieter Toddie	13 Hendrickse Cloeksvulle	<i>[Signature]</i>
E September	15 Hendrickse Str	<i>[Signature]</i>
W.J. Barends.	17 HENDRICKSE	<i>[Signature]</i>
G. DAVIDSE	26 RHODE STRAAT	<i>[Signature]</i>
G. SMITH	41 RHODE STRAAT	<i>[Signature]</i>
F. Cornelisan	23 Hendrickse Str.	<i>[Signature]</i>
T. SAMUELS	25 Hendricksestraat	<i>[Signature]</i>
N. S. CONDS	27 Hendrickse	<i>[Signature]</i>
H. ZANTONSKI	29 HENDRICKSE	<i>[Signature]</i>
L. Appolis	31 Hendrickse. Street.	<i>[Signature]</i>
M. FARAO	33 Hendrickse street	<i>[Signature]</i>
FRANK BUCHHANNEN	35 HENDRICKSE STRAAT	<i>[Signature]</i>
CHARLTON FRANS	37 HENDRICKSE STRAAT	<i>[Signature]</i>
M. Siebrits	39 Hendricksestraat 39	<i>[Signature]</i>
McCasal	39 Hendricksestr 39	<i>[Signature]</i>
G. Casal	39 Hendricksestr. STR	<i>[Signature]</i>
Ruthy Rhode	41 Hendrickse	<i>[Signature]</i>
Wafu U. Davidse	49 Gabriellstraat	<i>[Signature]</i>
S. Olive	41 HUNE STR	<i>[Signature]</i>
Jay Puristoo	49 Hendricksestr / 54 February 07	<i>[Signature]</i>

Hendricksestraat 2 (Erf 8963)
Cloetesville
Stellenbosch 7600

25 Februarie 2024

Mnr Rudolf Schröder
E-posadres Rudolf.schroder@zutari.com
Zutari (Edms) Bpk

Zutari se Aansoek om Hersonering, Onderverdeling, Toestemmingsgebruik, Afwyking en Sluiting van 'n Gedeelte van die Openbare Ruimte van Erf 7001 te Stellenbosch: Aansoekverwysing: LU/16572 en TP591/2023

Hiermee maak ek namens myself en inwoners van Hendricksestraat, Cloetesville ten sterkste beswaar teen Zutari se aansoek om die hersonering, onderverdeling, toestemmingsgebruik, afwyking en sluiting van 'n gedeelte van die openbare ruimte van erf 7001 te Cloetesville.

Hierdie gedeelte van Cloetesville is nie alleen die beste gedeelte van Cloetesville nie, maar 'n rustige en betreklik stil buurt waarvan verreweg die meeste erwe groter as 500 m² is en die huise ruim gesinshuise met motorhuise, tuine en ander ruimtes is. Die meeste wonings is die eienaars se grootste enkele belegging.

Nou wil u 'n ekonomiese ontwikkeling in die middel van ons stil, rustige buurt plaas en boonop die grootste gedeelte van 'n openbare oop ruimte daarvoor aanwend. Dis die verkeerde plek vir so 'n ontwikkeling. Ons is nie teen ontwikkeling gekant nie, maar die korrekte ontwikkeling vir hierdie area sou normale grootte erwe met gesinshuise wees; beslis nie 201 posseëlgrootte erfies met piepklein strukture daarop wat soos hare op 'n hond se rug ingeryg is nie.

Uit ervaring in ander woongebiede waar die munisipaliteit ook hierdie tipe ontwikkelings toegelaat het, sal elke struktuur en meegaande agterplaasruimtes deur minstens 4 tot 8 persone bewoon word. U kan self die som maak.

Die bogenoemde skep die indruk dat u eensydig besluit het dat die huidige inwoners maar verlief moet neem met die volgende, wat onvermydelik is:

- die oorbevolking van so 'n dige ontwikkelde, ekonomiese buurt,
- die verkeersdrukte wat daarmee gepaard gaan en waarvan die meeste via Hendricksestraat na die nuwe ontwikkeling gelei sal word,
- die geraas wat met so 'n dige bevolkte ontwikkeling gepaard gaan,
- die verhoogde risiko van misdaad soos diefstal, rommelstrooiery, ens. wat met so 'n dige bevolkte en ekonomiese ontwikkeling gepaard gaan, en
- laastens, die waardevermindering van ons eiendom wat aan 'n ekonomiese ontwikkeling grens met al die gepaardgaande probleme soos hierbo uiteengesit.

Boonop skep u aansoek die indruk dat die inwoners van Cloetesville nie 'n behoorlike oop ruimte vir 'n park, braaiplekke, ens. mag hê nie. Die beplande groen spasie op u voorgestelde kaart is uiteraard hopeloos te klein om Cloetesville te diens; dus kon u dit maar weggelaat het.

'n Mens kan nie help om te wonder hoe dit moontlik is dat so 'n verregaande plan op die beste deel van Cloetesville afgedwing kan word nie.

MP Beukes

Rudolf Schröder

From: Estelle Lourens <estelle@warwickwine.com>
Sent: Sunday, 25 February 2024 07:53
To: Rudolf Schröder
Cc: Ian Lourens; [redacted] Stander, Marietjie, Prof [redacted]
Subject: RE: Rezoning application of erf 7001 - Objection

You don't often get email from estelle@warwickwine.com. [Learn why this is important](#)

Application: LU/16572 and TP591/2023

To whom it my concern

I am the owner of Erf 14225, 15 Belladonna, Welgevonden Estate

I have read through the application and the details of the proposed development and have a number of points to raise:

1. **Parking:** The target market and associated lower car ownership for the future home-owners in this development, means that the minimum parking requirements could be reduced for the proposed development.

The central location of the site in close proximity to public amenities, economic opportunities as well as access to public transportation networks, also imply that a reduced number of private transport (car ownership) will be used by future home-owners in this development.



I strongly disagree with this statement – this development is not close to public amenities and definitely not to any public transportation networks. Taxis will be the only means of public transport. Therefore it is more likely people will have their own transport. You have attached a photo of Welgevonden where narrow streets are implemented. The reality looks a lot different – see attached how the same type of street looks at 7pm. It is dangerous to drive there – it is so crowded you can't see kids or pets running in the streets. It is unrealistic to believe people will not drive or park in these narrow streets.

2. You mention possible access points. The access point through Welgevonden Estate between erf 14225 and 14241 is not viable, as Welgevonden is a closed security estate. As mentioned the R44 entry into Welgevonden is already too congested and recent upgrading will barely allow for additional traffic from Voliere Estate. Thus it will put more pressure on both this access point as well as the R304 one. Waiting in queues in the morning to exit the estate is already a nightmare.
3. Stormwater: How will the detention Pond 2 influence underground water next to the retaining wall with Welgevonden? In winter this will be a body of open water – which means mosquitoes and most probably an undesirable smell due to pollution. You mention that it can be a recreational area in summer, but in winter

you have to fence it off to keep kids safe – thus the recreational aspect is lost. I foresee this area to be a stinking wetland in winter and a neglected piece of land in summer – who is going to keep it neat and clean? Our house overlooks this area directly...

4. With the proposed income group it is highly likely that young families will settle here. With a 102 homes – where will these kids go to school – the schools nearby is already overpopulated. Thus changing the building lines to fit in more homes is undesirable
5. What is the plan for the colony of Cape Eagle Owls nesting in the trees? I see that there will still be a area where the current trees are left intact, but the noise from such an overpopulated area will drive these birds away and there is already too much invasion into the natural habitat of these birds around Stellenbosch. Are the mature trees that will be removed, replaced with semi-mature trees? With such small properties there will be no space to plant any trees.

Therefore I object to the relaxing of parking requirements from 2 parking bays to 1 parking bay per dwelling house and I object to the relaxing of street building lines and common building lines.

Regards
Estelle Lourens



From: Rudolf Schröder <Rudolf.Schroder@zutari.com>
Sent: Friday, February 2, 2024 12:02 PM
To: Estelle Lourens <estelle@warwickwine.com>
Cc: Ian Lourens <lourens.ian@gmail.com>
Subject: Re: Rezoning application of erf 7001

Hi Estelle.

The full application with all the annexures can be downloaded by following this link:

<https://www.dropbox.com/scl/fo/srz1spkyepd69nn0kk2pw/h?rlkey=iv7gnf1viygwrx820aah7w237&dl=0>

Please do hesitate to contact me should you have any queries.

Kind regards,

Rudolf Schröder *Pr. Pln, M.PMSA, MTRP*

ASSOCIATE SPECIALIST | ZUTARI

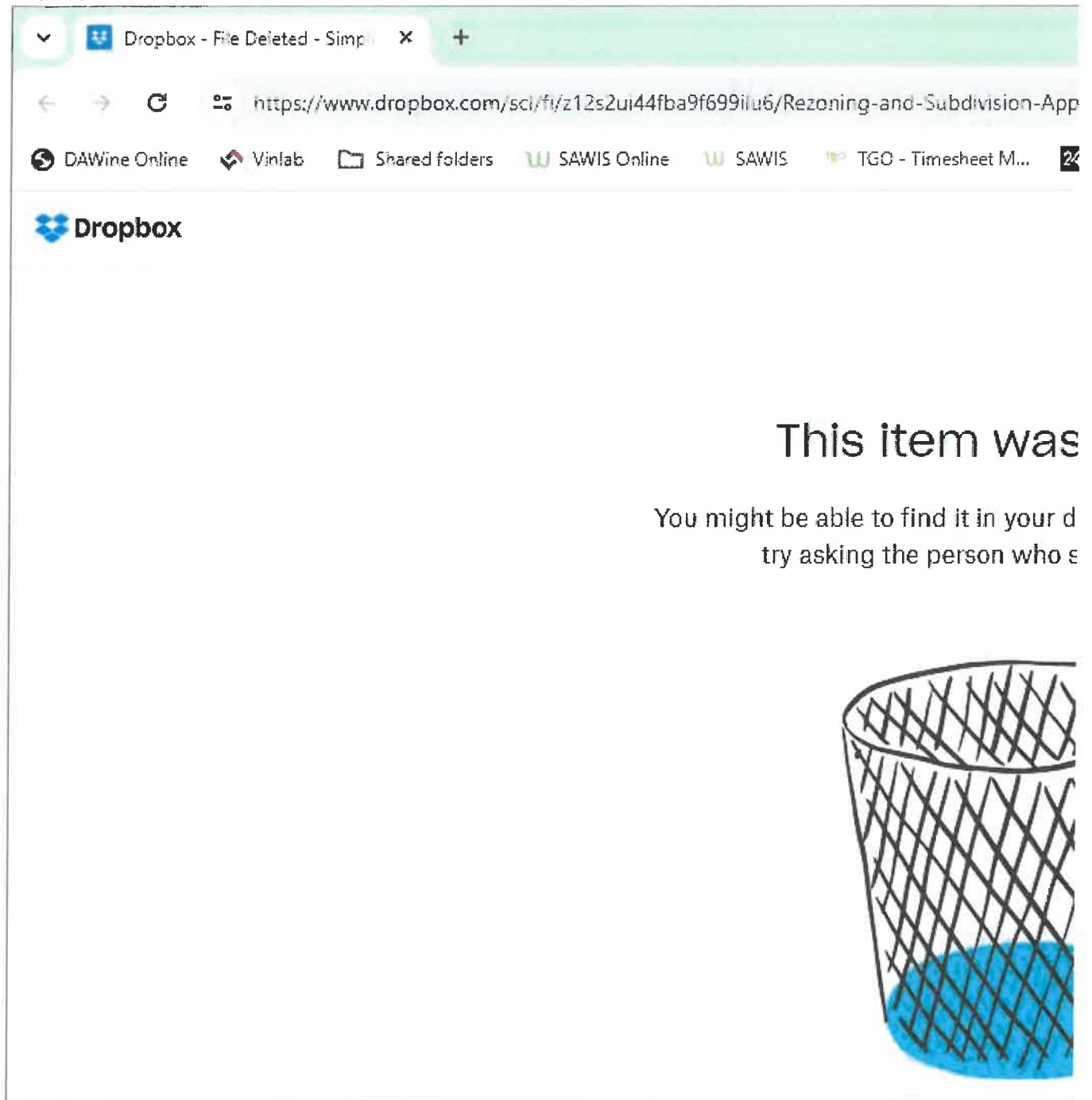
M +27-833906963 **E** Rudolf.Schroder@zutari.com **W** zutari.com

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From: Estelle Lourens <estelle@warwickwine.com>
Sent: Friday, February 2, 2024 11:55:18 AM
To: Rudolf Schröder <Rudolf.Schroder@zutari.com>
Cc: Ian Lourens <lourensi@warwickwine.com>
Subject: FW: Rezoning application of erf 7001

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Hi Rudolf

Can you please share the link – the one below has been deleted.
Thanks





Estelle Lourens
Winemaker



+27 (0)21 884 4410



estelle@warwickwine.com



www.warwickwine.com



R44, Stellenbosch, 7607

From: Stander, Marietjie, Prof [LCMS@sun.ac.za] <lcms@sun.ac.za>
Sent: Tuesday, January 30, 2024 11:07 AM
To: Ian Lourens <ilourensian@gmail.com>
Cc: Estelle Lourens <estelle@warwickwine.com>
Subject: FW: Rezoning application of erf 7001

From: Rudolf Schröder <Rudolf.Schroder@zutari.com>
Sent: Monday, January 29, 2024 8:54 AM
To: Stander, Marietjie, Prof [LCMS@sun.ac.za] <lcms@sun.ac.za>
Cc: Redelinghuys, Herman [redelinghuys@sun.ac.za] <redelinghuys@sun.ac.za>
Subject: Re: Rezoning application of erf 7001

You don't often get email from rudolf.schroder@zutari.com. [Learn why this is important](#)

CAUTION: This email originated from outside the Stellenbosch University network. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Dear Marietjie

The application can also be downloaded by following this link:

https://www.dropbox.com/scl/fi/z12s2ui44fba9f699ilu6/Rezoning-and-Subdivision-Application-of-Erf7001-Stellenbosch_Cloeteville-with-dividers_.pdf?rlkey=jq1oao5gujxx81x5kuxb17t0a&dl=0

Please let me know if you have any questions.

Kind regards,

Rudolf Schröder *Pr. Pln, M.PMSA, MTRP*

ASSOCIATE SPECIALIST | ZUTARI

M +27 833309999 **E** Rudolf.Schroder@zutari.com **W** zutari.com

From: Stander, Marietjie, Prof [LCMS@sun.ac.za] <LCMS@sun.ac.za>
Sent: Monday, January 29, 2024 8:32:28 AM
To: Rudolf Schröder <Rudolf.Schroder@zutari.com>
Cc: Redelinghuys, Herman [hredelinghuys@sun.ac.za] <hredelinghuys@sun.ac.za>
Subject: Rezoning application of erf 7001

You don't often get email from LCMS@sun.ac.za. [Learn why this is important](#)

Good day,

I am the owner of Erf 14241 in Welgevonden Estate. I received a letter from you regarding this application with a link to the relevant documents. There are 29 pages on that link and not one of them refer to Erf 7001. Could you please send me the electronic document?

Groete/Regards,

Marietjie
Prof Marietjie Stander PhD (Chemie)

Mass Spectrometry: Unit Manager | Massaspektrometrie Eenheidsbestuurder
Central Analytical Facilities | Sentrale Analitiese Fasiliteit

~~0800 3021~~
Room 255, JC Smuts building, Van der Byl Street
Stellenbosch, Suid-Afrika
ORCID ID: 0000-0003-0806-9734
<https://www.sun.ac.za/caf>



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Rudolf Schröder

From: Gavin Davidse <~~GavinDavidse@capitecbank.co.za~~>
Sent: Friday, 09 February 2024 08:05
To: Rudolf Schröder
Subject: RE: Application Reference: LU/16572 and TP591/2023

You don't often get email from gavindavidse@capitecbank.co.za. [Learn why this is important](#)

Hi Rudolf

Sorry for the delayed reply with regards to this application objection.

Firstly, Stellenbosch is already so congested when it comes to the traffic, and this will only make things worse.

Secondly, we have limited schools in Stellenbosch also and this application will also add to that strain.

Thirdly, there is several other developments happening just outside Cloeteville / Welgevonden area which will also have more impact on the current traffic strain.

Then lastly in this application there is no mentioning of what type of housing project this will be.

Regards

Gavin Davidse
 Service Delivery Manager
 Technology Service Delivery



T ~~021 888 8888~~ M ~~027 93 937 100~~
 GPS 33°57'54.7" S 18°49'50.9" E
 5 Neutron Road, Techno Park, Stellenbosch 7600
 PO Box 12451, Die Boord, Stellenbosch 7613
capitecbank.co.za

From: Rudolf Schröder <Rudolf.Schroder@zutari.com>
Sent: Wednesday, February 7, 2024 2:48 PM
To: Gavin Davidse <~~GavinDavidse@capitecbank.co.za~~>
Subject: RE: Application Reference: LU/16572 and TP591/2023



This email originated outside of Capitec Bank. DO NOT CLICK on links or attachments unless you recognise the sender and know the content is safe.

Hi Gavin

Thank you, your objection is noted.

Can you please provide more information as to the reasons for your objection?

We need to provide details of all comments received when we compile the public participation report.

Kind regards,

Rudolf Schröder *Pr. Pln, M.PMSA, MTRP*

ASSOCIATE SPECIALIST | ZUTARI

M +27-833906963 E Rudolf.Schroder@zutari.com W zutari.com

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From: Gavin Davidse <Gavin.Davidse@capitecbank.co.za>
Sent: Wednesday, February 7, 2024 2:45 PM
To: Rudolf Schröder <Rudolf.Schroder@zutari.com>
Subject: Application Reference: LU/16572 and TP591/2023

You don't often get email from gavindavidse@capitecbank.co.za. [Learn why this is important](#)

Good day Rudolf

This is with regards to the above-mentioned application in my area of residence. (26 Rhode Street Cloetessville Stellenbosch) Contact number: 083 937 4920

I strongly appose this application for rezoning in our area.

Regards

Gavin Davidse
 Service Delivery Manager
 Technology Service Delivery



T [083 937 4920](tel:0839374920)
GPS 33°57'54.7" S 18°49'50.9" E
 5 Neutron Road, Techno Park, Stellenbosch 7600
 PO Box 12451, Die Boord, Stellenbosch 7613
capitecbank.co.za

Rudolf Schröder

From: Henét de Villiers <[REDACTED]@vodamail.co.za>
Sent: Saturday, 24 February 2024 12:10
To: Rudolf Schröder
Cc: [REDACTED]@gmail.com, [REDACTED]@gmail.com, jacquesvdk@gmail.com, [REDACTED]@eldrustud.com, [REDACTED]@gmail.com
Subject: Comments on the application for land rezoning, subdivision, consent use, departure and closure of a part of a public space of Erf 7001 Stellenbosch
Attachments: letter to Zutari duly signed 24 Feb 2024.pdf

You don't often get email from henet@vodamail.co.za. [Learn why this is important](#)

Dear Rudolf

Find attached the written comments from affected and concerned homeowners of Welgevonden Estate, Stellenbosch.

The signatories are property owners of Erven 14745, 14747, 14748, 14749, 14750 and 14751 which are situated adjacent the northern border of the development as per the application. Kindly acknowledge receipt of this email and content.

Kind regards
Henet de Villiers

Rudolf Schröder

From: Jaco de Kock <jaco.de.kock@gmail.com>
Sent: Sunday, 18 February 2024 22:18
To: Rudolf Schröder
Cc: Alwyn van Jaarsveld
Subject: Versoek vir vergadering insake Landuse application - Erf 7001, Stellenbosch

You don't often get email from jaco.de.kock@gmail.com [Learn why this is important](#)

Goeiedag Rudolf,

Die "Land use application : erf 7001 stellenbosch" asook ons telefoniese gesprek verwys.

Ek skryf in samewerking met die eienaar van n eiendom in Wildeklaar straat, Welgevonden wat grens aan die voorgenome area vir ontwikkeling soos verwys word in die aansoek hierbo. Die eienaar is Alwyn van Jaarsveld - geCC in die epos. Ek verteenwoordig ook myself en ander eienaars in Welgevonden estate.

Ek verstaan dat as deel van die Standsbeplannings proses vir hierdie aansoek , daar geleentheid is vir publieke deelname om juis spesifieke kwessies, bekommernisse asook voorstelle vir n wen-wen vir die hele omliggende gemeenskap, te bespreek en uit te lig.

Ek wil die geleentheid gebruik om n paar sake uit te lig en daarmee saam te versoek of jy n vergadering namens ons met Stellenbosch Behuising kan fasiliteer so gou moontlik.

1. Ons verstaan daar is n behuisings tekort en dat die Munisipaliteit reeds areas geïdentifiseer het vir moontlike "mixed development"
2. Ons wil graag die opsies van uitleg van die erwe en strate asook groen areas bespreek - met verwysing na die 4 opsies in die aansoek dokument. Ons wil tog verstaan en seker maak dat die bestaande aangrensende Welgevonden gemeenskap ook in ag geneem word om die volhoubare welstand van beide die nuwe voorgenome ontwikkeling asook Welgevonden te verseker.
3. Die Welgevonden eienaars wil die sekuriteitsrisiko op die grens na Welgevonden uitlig. Daarmee saam wil ons voorstelle bespreek wat kondisies tydens die bouwerk / ontwikkelingsfase, asook die toekomstige sekuriteit instandhouding in plek kan sit en voorwaardes is.
4. Ons is ook besorg oor die uitleg en aanwending van groen areas en wil dit ook bespreek.

Mbt punt 3 hierbo wil ons as Welgevonden eienaars seker maak dat die Estate se sekuriteit nie verswak of blootgestel word nie.

- Tydens ontwikkeling van area, gaan die grensdraad en wonings direk blootgestel wees aan konstruksiewerke en ons versoek graag Behuising om voorkomend op te tree en nodige aanpassings / verbeterings te oorweeg
- Na afloop van konstruksie werk, is dit ook belangrik dat Behuising n paar voorstelle bring wat die aanhoudende sekuriteit, grens monitering , versterking ens verseker
- Byvoorbeeld: grensmuur of hek vergroot en verhoog, Nog kameras ens ens

Behalwe vir sekuriteit wil ons ook spesiiek reënwater "run off" en dreineringsstelsel verstaan tussen die erwe wat grens aan die Wildeklaar eiendomme. Tog moet die run-off en dreinerings nie bestaande eiendomme belemmer of in vloed gevaar sit nie.

Rudolf, ek vertrou bogenoemde is reeds n paar kondisies en voorstelle wat ek hoop en vertrou Behuising holisties alle bestaande gemeenskappe se behoeftes en besorgdhede in ag neem.

Sal Jy asb so gaaf wees om n vergadering te reël met Behuising?

Ons hoop en vertrou op n wen-wen benadering - Maw nie net die ontwikkeling van Erf 7001 bestuur en in plek sit maar ook seker maak dat bestaande gemeenskappe soos Welgevonder en hulle eienaars ook in ag neem.

Laat weet gerus moontlike "timeslots" vir n vergadering.

Baie dankie vir jou koördinerings , bereidwilligheid en raad tydens die proses.

Jaco de Kock

072-1937705

Rudolf Schröder

From: Jaco de Kock <jaco.dekock@gmail.com>
Sent: Monday, 19 February 2024 21:50
To: Rudolf Schröder
Cc: Alwyn van Jaarsveld
Subject: Re: Versoek vir vergadering insake Landuse application - Erf 7001, Stellenbosch

You don't often get email from jaco.dekock@gmail.com. [Learn why this is important](#)

Dankie Rudolf,

Ons hoor graag sodra Munisipaliteit kan vergader.
Baie dankie

Groete/Regards

Jaco de Kock
0724337707

On Mon, Feb 19, 2024 at 9:40 AM Rudolf Schröder <Rudolf.Schroder@zutari.com> wrote:

Hi Jaco

Dankie vir jou epos.

Ek het dit vir die munisipaliteit gestuur en sal jou op hoogte hou met betrekking tot n voorgestelde tyd/datum vir n vergadering.

Groete,

Rudolf Schröder *Pr. Pln, M.PMSA, MTRP*

ASSOCIATE SPECIALIST | ZUTARI

M +27-833906963 **E** Rudolf.Schroder@zutari.com **W** zutari.com

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From: Jaco de Kock <jaco.dekock@gmail.com>
Sent: Sunday, February 18, 2024 10:18 PM
To: Rudolf Schröder <Rudolf.Schroder@zutari.com>

Cc: Alwyn van Jaarsveld <[REDACTED]>

Subject: Versoek vir vergadering insake Landuse application - Erf 7001, Stellenbosch

You don't often get email from [REDACTED] [Learn why this is important](#)

Goeiedag Rudolf,

Die "Land use application : erf 7001 stellenbosch" asook ons telefoniese gesprek verwys.

Ek skryf in samewerking met die eienaar van n eiendom in Wildeklawer straat, Welgevonden wat grens aan die voorgenome area vir ontwikkeling soos verwys word in die aansoek hierbo. Die eienaar is Alwyn van Jaarsveld - geCC in die epos. Ek verteenwoordig ook myself en ander eienaars in Welgevonden estate.

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Mbt punt 3 hierbo wil ons as Welgevonden eienaars seker maak dat die Estate se sekuriteit nie verswak of blootgestel word nie.

- Tydens ontwikkeling van area, gaan die grensdraad en wonings direk blootgestel wees aan konstruksiewerke en ons versoek graag Behuising om voorkomend op te tree en nodige aanpassings / verbeterings te oorweeg
- Na afloop van konstruksie werk, is dit ook belangrik dat Behuising n paar voorstelle bring wat die aanhoudende sekuriteit, grens monitering , versterking ens verseker
- Byvoorbeeld: grensmuur of hek vergroot en verhoog, Nog kameras ens ens

Behalwe vir sekuriteit wil ons ook spesieel reënwater "run off" en dreineringsstelsel verstaan tussen die erwe wat grens aan die Wildeklaar eiendom. Tog moet die run-off en dreinerings nie bestaande eiendom belemmer of in vloed gevaar sit nie.

Rudolf, ek vertrou bogenoemde is reeds n paar kondisies en voorstelle wat ek hoop en vertrou Behuising holisties alle bestaande gemeenskappe se behoeftes en besorgdhede in ag neem.

Sal Jy asb so gaaf wees om n vergadering te reël met Behuising?

Ons hoop en vertrou op n wen-wen benadering - Maw nie net die ontwikkeling van Erf 7001 bestuur en in plek sit maar ook seker maak dat bestaande gemeenskappe soos Welgevonder en hulle eienaars ook in ag neem.

Laat weet gerus moontlike "timeslots" vir n vergadering.

Baie dankie vir jou koördinering , bereidwilligheid en raad tydens die proses.

Jaco de Kock

0721597707

[TRANSLATED]

Good day Rudolph,

The "Land use application : erf 7001 stellenbosch" as well as our telephone conversation refers.

I am writing in collaboration with the owner of a property in Wildeklawer street, Welgevonden which borders the proposed area for development as referred to in the application above. The owner is Alwyn van Jaarsveld - CCed in the email. I also represent myself and other owners in Welgevonden estate.

I understand that as part of the Stand Planning process for this application, there is an opportunity for public participation to discuss and highlight specific issues, concerns as well as proposals for a win-win for the entire surrounding community.

I would like to use the opportunity to highlight a few matters and with that request if you can facilitate a meeting on our behalf with Stellenbosch Housing as soon as possible.

1. We understand that there is a housing shortage and that the Municipality has already identified areas for possible "mixed development"
2. We would like to discuss the options of layout of the plots and streets as well as green areas - with reference to the 4 options in the application document. We do want to understand and make sure that the existing adjacent Welgevonden community is also taken into account to ensure the sustainable well-being of both the new proposed development and Welgevonden.
3. The Welgevonden owners want to highlight the security risk on the border to Welgevonden. Along with this, we want to discuss proposals which conditions can be put in place during the construction / development phase, as well as the future security maintenance and conditions.
4. We are also concerned about the layout and use of green areas and want to discuss this as well.

Regarding point 3 above, we as Welgevonden owners want to make sure that the Estate's security is not weakened or exposed.

- During area development, the boundary wire and dwellings will be directly exposed to construction workers and we would like to request Housing to take preventive action and consider necessary adjustments / improvements
- After completion of construction work, it is also important that Housing brings some proposals that ensure continuous security, border monitoring, reinforcement etc.
- For example: border wall or gate enlarged and raised, More cameras etc etc

Besides security, we also specifically want to understand rainwater "run off" and the drainage system between the plots that border the Wildeklawer properties. However, the run-off and drainage must not obstruct or endanger existing properties.

Rudolf, I trust the above are already some conditions and proposals that I hope and trust Housing holistically takes into account the needs and concerns of all existing communities.

Would you please be so kind as to arrange a meeting with Behuising?

We hope and trust in a win-win approach - ie not only manage and put the development of Erf 7001 in place but also make sure that existing communities like Welgevonder and their owners also take into account.

Please let me know possible "timeslots" for a meeting.

Thank you very much for your coordination, willingness and advice during the process.

Jaco de Kock

078 1337703

Mr Rudolf Schröder
ZUTARI
George
Per email: Rudolf.Schroder@zutari.com

Dear Rudolph

**COMMENT ON THE LAND DEVELOPMENT APPLICATION: ERF 7001, STELLENBOSCH
(CLOETESVILLE HOUSING DEVELOPMENT)**

The landowners of Erven 14745, 14747, 14748, 14749, 14750 and 14751 Welgevonden Estate herewith submit the comments to the above application. We, as the affected residents in Welgevonden Estate, are neighboring landowners to the north of the proposed development site and are interested and concerned parties who share the same municipal services infrastructure.

We would first like to note that only two of the homeowners in this appeal, received a hand-delivered written notice to his/her address. The other owners did not receive any notification via email or hand delivery to the respective home addresses, and we object to not being duly notified and invited to comment, other than a notification received via the HOA of Welgevonden Estate.

Although we acknowledge the need for housing, the challenge of a shortage is a universal problem in South Africa and not only in Stellenbosch. Any desirable development should benefit all and not be to the existing homeowner's detriment. It is our respectful submission that the Municipality's decision must be informed by, amongst others, the comments and considerations recorded by the HOA of Welgevonden Estate and delivered on 22 February 2024. **We submit our comments in addition to the HOA of Welgevonden Estate's remarks.**

This application refers to medium to upper (GAP) housing. A proper clarification/definition of medium to upper (GAP) housing is required. In the document: DEADP Letter confirming that no environmental authorisation is required (Figure 56 and clause 2.1.1), the author refers to an application for low-cost housing: "The proposal entails the construction of a low-cost housing development on Erf no 7001". These contradictory descriptions of the type of housing create confusion.

Find our comments below:

A. Traffic and transport

Congestion of roads | inadequate service. We strongly reject the traffic impact assessment (TIA) submitted as part of the application which states that the levels of service at intersections in the surrounding area, as indicated in the TIA paragraph 5.3 are acceptable. It is stated in clause 5.3.6.3 that: "The additional traffic created by the development is not the cause of the failing intersection at the R44". We reject this statement as the applicant cannot claim this as a fact without accounting for the expected increase in traffic.

The provision for only 100 trips for 204 units is greatly underestimated (Table 9).

B. External services

- The potable water system and periodic water pressure problems experienced by parts of Welgevonden are caused by the combined effect of low reservoir capacity, load shedding, and the inability of the reservoir feeder pumps and pipes to supply sufficient water to the reservoirs in between load shedding cycles. The proposed development will be even more disadvantaged and additional consumers will affect the Welgevonden water supply more profoundly.

The Welgevonden HOA recommended upgrading the network and providing sufficient funding for the required upgrades.

- Stormwater. The risk of northward stormwater drainage and localised flooding of the Welgevonden infrastructure and individual properties must be avoided. The Welgevonden systems were not designed with the capacity for any developments on the subject property. Increased runoff and the compound effects of climate change will place further stress on the systems. The current stormwater plans and designs need to be re-evaluated to ensure appropriate capacity in the system.

C. Layout

- Layout plan. The layout should be more considerate of the existing Welgevonden residences, especially on the northwestern side (preferred layout Erven numbers 167 – 170 and 199 – 201).
- The area representing Erf 12214, previously subdivided from Erf 7001 and closed as a public Erf, was allegedly never registered in the Deeds Office, as per clause 2.6. The

homeowners of the adjacent Erven in Welgevonden were told upon purchase of their respective properties that the Erf 12214 would remain a servitude and would never be developed. It was not revealed that the Municipality did not register this subdivision. In the application, Figures 29 and 31 (scenario 3 as proposed) exclude this area in the new development. In Figure 32, this area is included in the development and "XX-Large 220 above" dwellings are marked in red. Clarity should be given whether this area will be developed or not.

- If so, the Welgevonden homeowners commenting on the development duly object to the development parameters set out in the application for rezoning where the boundary building lines are reduced to 0 meters.
- A steep slope/incline will befall the new Erven (8 to 12) planned on the current servitude Erf 12214, specifically next to the boundary wall (Figure 61). This will cause pressure on the boundary wall, possibly moving the boundary wall and causing cracks in the properties situated at Erven 14745, 14747, 14748, 14749, 14750, and 14751 Welgevonden. Inspection of the foundation, steel reinforcing, stability of the boundary walls, and cost implication to reinforce them, should be done.
- Servitude provision. Past incidents along other boundaries of Welgevonden Estate show that some owners of the Cloeteville properties establish informal dwellings in the backyards abutting the Welgevonden fence and properties. This creates an undesirable situation, not only with a negative effect on the property values of the neighboring Welgevonden properties but also on the health and well-being of the Welgevonden neighbors, not to mention the situation of the residents of these informal accommodation units. It is proposed that servitudes to prevent the construction of informal structures used for human habitation or accommodation be registered in favor of the WHOA residential erven abutting the Welgevonden boundary, to avoid the occurrence of backyard settlement. The servitudes need to be imposed as personal servitudes in favor of the WHOA and worded to restrict any human habitation in any informal structure and any informal structures from being erected in the backyards of properties adjacent to the Welgevonden properties. Servitude and title restrictions will allow the WHOA to act against any contravening owner, given the lack of capacity and failure by the Municipality to enforce its Bylaws in such instances.

D. Environmental impact.

The property contains mature trees that have become a landmark and these trees, as referred to in clause 5.2.6, inhabit a few spotted eagle owl families for many years. By removing the trees, the owl's habitat will be destroyed. Certain species of owls prefer old forests or trees that provide tree hollows or suitable nest sites and felling of the trees could lead to the verge of local extinction. To determine the impact of the project, a thorough assessment (EIA) of owls' habitat by an independent registered professional member of The South African Council for Natural Scientific Professions, should be conducted. The following acts must be considered: The National Environmental Management: Biodiversity Act (NEMBA) and the nature conservation acts and ordinances for Western Cape.

E. Noise pollution. As indicated in some Figures in the application, there will be housing very close to the boundary wall where the natural elevation inclines rapidly. Single and double-story units will be much higher than the existing Welgevonden homes, resulting in loss of privacy, blocking of natural light and severe noise pollution.

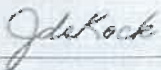
F. Property value.

The houses in the surrounding area of Cloetesville and Welgevonden have significant value, and value retention is essential for the owners and the Municipality, which generates rates and taxes on the basis thereof. The value of houses built in the development should be comparable to house values in the surrounding area.

Should the development be aimed at low-cost housing proceed and considering the listed concerns of the authors, the affected properties adjacent to the boundary wall, will lose substantial value.

The affected Welgevonden homeowners herewith offer our remarks and concerns and oppose granting the rezoning application as submitted.

Yours faithfully



Mr J de Kock

Erf 14747

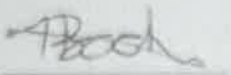
Email: 



Mr MJ and Mrs A Geldenhuys

Erf 14745

Email: 



Mr H Bock

Erf 14748

Email: 



Mrs L van Zyl

Erf 14750

Email: 



Ms H de Villiers

Erf 14749

Email: 



Mr H Schreuder

Erf 14751

Email: 

Mr Rudolf Schroder
ZUTARI
George
Per email: RudoltSchroder@zutari.CQm

Dear Rudolph

**COMMENT ON THE LAND DEVELOPMENT APPLICATION: ERF 700L STELLENBOSCH
(CLOETESVILLE HOUSING DEVELOPMENT)**

The landowners of Erven 14745, 14747, 14748, 14749, 14750 and 14751 Welgevonden Estate herewith submit the comments to the above application. We, as the affected residents in Welgevonden Estate, are neighboring landowners to the north of the proposed development site and are interested and concerned parties who share the same municipal services infrastructure.

We would first like to note that only two of the homeowners in this appeal, received a hand-delivered written notice to his/her address. The other owners did not receive any notification via email or hand delivery to the respective home addresses, and we object to not being duly notified and invited to comment, other than a notification received via the HOA of Welgevonden Estate.

Although we acknowledge the need for housing, the challenge of a shortage is a universal problem in South Africa and not only in Stellenbosch. Any desirable development should benefit all and not be to the existing homeowner's detriment, it is our respectful submission that the Municipality's decision must be informed by, amongst others, the comments and considerations recorded by the HOA of Welgevonden Estate and delivered on 22 February 2024. **We submit our comments in addition to the HOA of Welgevonden Estate's remarks.**

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seyapi s

Find our comments below:

A. Traffic and transport

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- The potable and periodic water pressure problems experienced by parts of Welgevonden are caused by the combined effect of low reservoir capacity, load shedding, and the inability of the reservoir feeder pumps and pipes to supply sufficient water to the reservoirs in between load shedding cycles. The proposed development will be even more disadvantaged and additional consumers will affect the Welgevonden water supply more profoundly.

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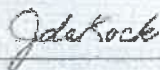
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The affected Welgevonden homeowners herewith offer our remarks and concerns and oppose granting the rezoning application as submitted.

Yours faithfully



Mr J de Kock

Erf 14747

Email: jaquessvzdl@gmail.com



Mr MJ and Mrs A Geldenhuys

Erf 14745

Email: am@remgro.com

ODYSSEY APPS

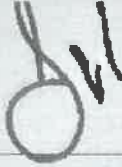
SCANNER



Mr H Bock

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Mrs L van Zyl

Erf 14750

Email: ls@vanzyl.com



Ms H de Villiers

Erf 14749

Email: hene@tiscali.com



Mr H Schreuder

Erf 14751

Email: h.schreuder@tiscali.com

Rudolf Schröder

From: Lohan Jansen van Vuuren <lohanjv@gmail.com>
Sent: Thursday, 01 February 2024 17:07
To: Rudolf Schröder
Subject: Re: Erf 7001 land development notice

You don't often get email from lohanjv@gmail.com. [Learn why this is important](#)

Thanks Rudolf, we really appreciate the feedback.

I have a couple of things I just want to check with you, if you don't mind:

- Is the proposed development plan Figure 21 or Figure 31 in the document? The reason for my question is that we recently bought our house (6 Mistel street) specifically with the views and safety in mind, as the road is blocked off and there are 2 fences currently between our home and the resevier area. In Figure 21 it seems like the housing would be directly next to our house, whereas it looks like in Figure 31 there's still an open area and road between our house and the proposed housing (we would obviously prefer the 2nd option - Figure 31).

- If all is approved, when is the estimated start date for the project? How long is it expected to take?

- Will this be a closed/fenced development/estate - similar to Welgevonden, with security etc? As safety and privacy would be a major concern for us based the current state of other municipal housing in the immediate area.

- What can we expect the change in value of our property be as a result of the development to be (any indication/estimations)? I realise this isn't a simple question, but one we would need to seriously consider.

Kind regards,
 Lohan

On Thu, 1 Feb 2024 at 08:24 Rudolf Schröder <Rudolf.Schroder@zutari.com> wrote:

Hi Lohan

Thank you for your email.

The full application with all the annexures can be downloaded by following this link:

<https://www.dropbox.com/scl/fo/srz1spkyepd69nn0kk2pw/h?rlkey=p0jcnvsjxckjckbxs2cbg32wz&dl=0>

The municipality owns the land and appointed us to plan the development on their behalf.

The particular goal of this housing development is the delivery of medium to upper (GAP) housing units (thus **not** low cost subsidised housing, but rather affordable bonded housing).

The target market is people that earn too much and do not qualify for subsidised housing, but do not earn enough to buy the typical houses available on the market (like for instance nurses, police men, municipal officials, teachers etc).

There are around 200 units planned, all full title that will be designed to fit into the character of the area (not dissimilar to the cluster units found in the Welgevonden estate). There could be some row housing units, semi-detached and free standing homes.

Please have a look at the motivation report and proposed subdivision plan and do not hesitate to contact me should you require any further information or if you have any queries.

Kind regards,

Rudolf Schröder *Pr. Pln, M.PMSA, MTRP*

ASSOCIATE SPECIALIST | ZUTARI

M +27-833906963 E Rudolf.Schroder@zutari.com W zutari.com

DISCLAIMER

From: Lohan Jansen van Vuuren <lohanjv@gmail.com>

Sent: Wednesday, January 31, 2024 3:32 PM

To: Rudolf Schröder <Rudolf.Schroder@zutari.com>

Subject: Erf 7001 land development notice

You don't often get email from lohanjv@gmail.com [Learn why this is important](#)

Hi Rudolf

I trust you are well and are having a good week.

We are new home owners in Welgevonden and have recently received the notice of the land development application. As a result, we don't have a lot of context on the exact areas of Erf 7001 that has been identifier for development or what type of development it would be.

We would really appreciate any information as to what the development plans are?

Kind regards

Lohan Jansen van Vuuren

Rudolf Schröder

From: Stander, Marietjie, Prof [lcms@sun.ac.za] <lcms@sun.ac.za>
Sent: Wednesday, 31 January 2024 10:20
To: Rudolf Schröder
Subject: RE: Rezoning application of erf 7001-Objection

You don't often get email from lcms@sun.ac.za. [Learn why this is important](#)

Morning,

Thanks for the explanation. Will there be security on that side to call if there are nuisances? Currently the Welgevonden Security can be called when people smoke drugs behind our house or have loud music? The Welgevonden Estate dam is closed after hours, would there be a possibility to do the same?

Groete/Regards,

Marietjie

Prof Marietjie Stander PhD (Chemie)

Mass Spectrometry: Unit Manager | Massaspektrometrie Eenheidsbestuurder
 Central Analytical Facilities | Sentrale Analitiese Fasiliteit

[+27 21 888 3070](tel:+27218883070)

Room 255, JC Smuts building, Van der Byl Street

Stellenbosch, Suid-Afrika

ORCID ID: 0000-0003-0806-9734

<https://www.sun.ac.za/caf>



From: Rudolf Schröder <Rudolf.Schroder@zutari.com>
Sent: Tuesday, January 30, 2024 3:33 PM
To: Stander, Marietjie, Prof [lcms@sun.ac.za] <lcms@sun.ac.za>
Subject: RE: Rezoning application of erf 7001-Objection

You don't often get email from rudolf.schroder@zutari.com. [Learn why this is important](#)

CAUTION: This email originated from outside the Stellenbosch University network. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Dear Marietjie

The design for the proposed stormwater dam is not yet finalised, so we cannot say exactly what it will look like, but it is expected that it will have some standing water (especially in the winter time). Its not planned that the dam will be fenced and it will be open to the public.

Kind regards,

Rudolf Schröder *Pr. Pln, M.PMSA, MTRP*

ASSOCIATE SPECIALIST | ZUTARI

M +27-833906963 **E** Rudolf.Schroder@zutari.com **W** zutari.com

DISCLAIMER

From: Rudolf Schröder

Sent: Tuesday, January 30, 2024 2:58 PM

To: Stander, Marietjie, Prof [REDACTED] <lgms@sun.ac.za>

Cc: Redelinghuys, Herman [herdelinghuys@sun.ac.za] <herdelinghuys@sun.ac.za>; Ian Lourens <ianlourens@gmail.com>; namag@welgevonden.co.za

Subject: RE: Rezoning application of erf 7001-Objection

Dear Prof Marietjie Stander

Thank you for your email / objection.

We acknowledge receipt.

We note your objection and request for additional information on the stormwater dam – I will try and get that information through to you.

Kind regards,

Rudolf Schröder *Pr. Pln, M.PMSA, MTRP*

ASSOCIATE SPECIALIST | ZUTARI

M +27-833906963 **E** Rudolf.Schroder@zutari.com **W** zutari.com

DISCLAIMER

From: Stander, Marietjie, Prof [REDACTED] <lgms@sun.ac.za>

Sent: Tuesday, January 30, 2024 12:58 PM

To: Rudolf Schröder <Rudolf.Schroder@zutari.com>

Cc: Redelinghuys, Herman [herdelinghuys@sun.ac.za] <herdelinghuys@sun.ac.za>; Ian Lourens <ianlourens@gmail.com>; namag@welgevonden.co.za

Subject: FW: Rezoning application of erf 7001-Objection

You don't often get email from [REDACTED] [Learn why this is important](#)

Application: LU/16572 and TP591/2023

To whom it my concern

I am the owner of Erf 14241 situated at 17 Belladonna, Welgevonden Estate

I have studied your development plans and although I am in favour of developing the area, I feel that the same rules should apply as to the rest of the area. Welgevonden has already a parking problem, the same will happen to the new development if the parking bays are reduced. Most families have 2 breadwinners that needs 2 cars to get to their workplace and have visitors that need parking.

By changing building lines to fit in more houses and buildings will overpopulate the area and cause more pressure on the roads and infrastructure, and will also affect the surrounding neighbours with more noise.

I object to the relaxing of parking requirements from 2 parking bays to 1 parking bay per dwelling house.
I object to the relaxing of street building lines and common building lines.

I would like to have more information about the dam that is planned right next to my house and the plans regarding the colony of Cape Eagle Owls that lives in the trees behind our house.
Will it be an open body of water? What about mosquitos? Who will have access to it and will it cause noise and disturbance?

Groete/Regards,

Marietjie

Prof Marietjie Stander PhD (Chemie)

Mass Spectrometry: Unit Manager | Massaspektrometrie Eenheidsbestuurder
Central Analytical Facilities | Sentrale Analitiese Fasiliteit
+27 31 808 3625

Room 255, JC Smuts building, Van der Byl Street
Stellenbosch, Suid-Afrika
ORCID ID: 0000-0003-0806-9734
<https://www.sun.ac.za/caf>



From: Stander, Marietjie, Prof [mailto:MS@sun.ac.za]
Sent: Tuesday, January 30, 2024 11:07 AM
To: Ian Lourens <ianlourens@gmail.com>
Cc: Estelle Lourens <estelle@warrickwinet.com>
Subject: FW: Rezoning application of erf 7001

From: Rudolf Schröder <Rudolf.Schroder@zutari.com>
Sent: Monday, January 29, 2024 8:54 AM
To: Stander, Marietjie, Prof [LCMS@sun.ac.za] <lcms@sun.ac.za>
Cc: Redelinghuys, Herman [hredelinghuys@sun.ac.za] <hredelinghuys@sun.ac.za>
Subject: Re: Rezoning application of erf 7001

You don't often get email from rudolf.schroder@zutari.com. [Learn why this is important](#)

CAUTION: This email originated from outside the Stellenbosch University network. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Dear Marietjie

The application can also be downloaded by following this link:
<https://www.dropbox.com/scl/fi/z12s2ui44fba9f699ilu6/Rezoning-and-Subdivision-Application-of-Erf7001-Stellenbosch-Cloeteville-with-dividers.pdf?rlkey=jg1oao5guijxx81x5kuxb17t0a&dl=0>

Please let me know if you have any questions.

Kind regards,

Rudolf Schröder *Pr. Pln, M.PMSA, MTRP*

ASSOCIATE SPECIALIST | ZUTARI

M +27-833906963 E Rudolf.Schroder@zutari.com W zutari.com

DISCLAIMER

From: Stander, Marietjie, Prof [LCMS@sun.ac.za] <lcms@sun.ac.za>
Sent: Monday, January 29, 2024 8:32:28 AM
To: Rudolf Schröder <Rudolf.Schroder@zutari.com>
Cc: Redelinghuys, Herman [hredelinghuys@sun.ac.za] <hredelinghuys@sun.ac.za>
Subject: Rezoning application of erf 7001

You don't often get email from lcms@sun.ac.za. [Learn why this is important](#)

Good day,

I am the owner of Erf 14241 in Welgevonden Estate. I received a letter from you regarding this application with a link to the relevant documents. There are 29 pages on that link and not one of them refer to Erf 7001. Could you please send me the electronic document?

Groete/Regards,

Marietjie

Prof Marietjie Stander PhD (Chemie)

Mass Spectrometry: Unit Manager | Massaspektrometrie Eenheidsbestuurder
 Central Analytical Facilities | Sentrale Analitiese Fasiliteit

+27-21-812-1111

Room 255, JC Smuts building, Van der Byl Street
Stellenbosch, Suid-Afrika
ORCID ID: 0000-0003-0806-9734
<https://www.sun.ac.za/caf>



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Die integriteit en vertroulikheid van hierdie e-pos word deur die volgende bepalinge bereël: [Vrywaringsklousule](#)

Rudolf Schröder

From: Martin Smith <martinjonathan.smith@gmail.com>
Sent: Thursday, 22 February 2024 21:14
To: Rudolf Schröder
Subject: Comment on land development application – Erf 7001

You don't often get email from [martinjonathan.smith@gmail.com](#). [Learn why this is important](#)

Dear Sir,

We are residents and homeowners in Welgevonden Estate.

We would like it officially noted we FULLY support ALL the comments/objections/concerns raised and submitted by Welgevonden HOA/Excom in respect to the above application/development, and in particular (in our case) in reference to the 'Traffic & Transport' and 'External Services'.

The LoS aspect is particularly of concern, when you consider the existing situation in respect to Welgevonden and surrounding (existing) residences of Cloeteville, where we already have major concerns of the (relatively) imminent additional impact of the Newinbosch estate development (R304) and the Voliere estate right next to Welgevonden estate, on the R44, before you even consider the impact of a further development at erf7001...

It seems to us that the Municipality is hell-bent on 'allowing' anything that will raise MORE local Rates revenue, with no realistic plan or regard to impact on the local Infrastructure and Services, which are ALREADY way beyond their originally planned/intended capacity.

Sincerely,
Martin Smith (& Sarah Schultz) - Erf 5373.

23 February 2024

Municipal Manager
 Stellenbosch Municipality
 NPK Building
 1s Floor
 C/o Reyneveld and Van Riebeeck Streets
 Stellenbosch
 7600

Attention: municipal.manager@ Stellenbosch.gov.za
Geraldine.Mettler@ Stellenbosch.gov.za
Raydine.Wenn@ Stellenbosch.gov.za
Nomie.Tshefu@ Stellenbosch.gov.za

Applicant: Rudolf Schroder
rudolf.schroder@zutari.com

Objector: **Mr Muller and Dr Van Gend-Muller**
jani.vangend@gmail.com
 0827549941 (Jani)
Charl.muller@gmail.com
 0798246157 (Charl)

Sir/Madam

CLOETESVILLE HOUSING DEVELOPMENT – APPLICATION FOR REZONING, SUBDIVISION, CONSENT USE, DEPARTURE AND CLOSURE OF A PUBLIC PLACE OF ERF 7001 CLOETESVILLE, STELLENBOSCH

Reference is made to a letter with application referenced LU/16572 and TP 591/2023.

As the land **owner and residents of Erf 14746 Stellenbosch** we hereby comment on and object to the application for the REZONING, SUBDIVISION, CONSENT USE, DEPARTURE AND CLOSURE OF A PUBLIC PLACE OF ERF 7001 CLOETESVILLE, STELLENBOSCH. We do support formal development of underutilised urban land to provide for formal housing of the many marginalised communities, but need clarity and the assurance that the municipality will implement the proposed residential mix of housing in accordance with the Chapter 7 Conventional Residential Zone parameters clearly illustrated in Section 48 of the Stellenbosch Municipality Zoning Scheme By-Law 2019

The reason for our objection is detailed in the following paragraphs:

1. THE APPLICATION IS CONFUSING, FLAWED AND CONTRADICTORY

- The applicant incorrectly states in Part C of the Land Use Application Form that NO restrictive conditions exist in the title deed. This statement is unsubstantiated and incorrect for the following reasons.

The application is submitted without crucial information prescribed by the Municipal By-Law on Land Use Planning. Section 38 of the said By-Law stipulates that the application **must** be accompanied by:

- *"Section 38 (1) (l), a copy of the title deed of the land concerned."*
- **No** copy of the Title Deed was made available and no assurance is given that the original Pivot or current deed impacts on the proposed use of the land.
- *"Section 38 (1)(m) a conveyancers certificate indicating that the application is not restricted by any condition contained in the title deed pertaining to the application property or **all** historical deeds."*

No conveyancers Certificate as prescribed by the By-Law is attached, making the application incomplete.

- *"Section 41 (l) stipulates that the Municipality must –
(b) verify whether the application complies with Section 38;"*

No confirmation or approval of the aforementioned is provided.

The failure to provide the aforementioned required minimum documentation required in terms of Section 38 (1), is not only a statutory requirement but can mislead the interested and affected parties.

- I acknowledge that the planning Motivation Report is well prepared and supported by a number of technical studies however the report is silent on the housing typology intended on the previously subdivided erven of Erf 12214. See Paragraph 3.6. f the Planning Motivation Report. Will these erven be made available to developers, individual investors for the student accommodation?
- In paragraph 3.6.1 namely Housing Precedent, the application makes reference to the various housing example [les that could be developed. However, the Report mentions *"that the actual designs of housing units will still be determined and confirmed during the detail design sage and with further consultations with the Municipality."* What guarantee will the Welgevonden residents and particularly those directly abutting the boundary of the site have that the estate will be included in the further consultation when the site development plan and building plans are prepared. Non-conforming residential units will have a detrimental affect on the property values of the Welgevonden estate and safety and security of the residents residing in this sought after estate.

- We accordingly reserve our right to comment further on this application once the information identified above has been provided to interested and affected parties to this LDA and proper consultation with neighbouring landowners has taken place.

2. **CONCLUSION**

In closing we reiterate the fact that we support the concept of sustainable and integrated human settlements which should simultaneously protect and enhance the sense of place and settlement patterns of the surrounding neighbourhoods as quoted in the Settlement Policy Objectives of the Provincial Spatial Development Framework.

Please acknowledge receipt of this objection.

Yours sincerely

A handwritten signature in cursive script, appearing to read 'Muller' followed by 'Dr. van Gend-Muller', written over a horizontal line.

Mr Muller and Dr Van Gend-Muller

Rudolf Schröder

From: Pierre Greeff <pierre@suprafamilias.com>
Sent: Monday, 29 January 2024 13:46
To: Rudolf Schröder
Subject: Re: Welgevonden Planning advertisement

You don't often get email from pierre@suprafamilias.com. [Learn why this is important](#)

Thank you for the information. Im
 Happy to give the go ahead.

On Mon, Jan 29, 2024 at 1:27 PM Rudolf Schröder <Rudolf.Schroder@zutari.com> wrote:

Hi Pierre

Its a middle-income housing development that is planned with around 200 residential units planned to fit in with the character of the area.

Kind regards,

Rudolf Schröder *Pr. Pln, M.PMSA, MTRP*

ASSOCIATE SPECIALIST | ZUTARI

M +27-833906963 E Rudolf.Schroder@zutari.com W zutari.com

DISCLAIMER

From: Pierre Greeff <pierre@suprafamilias.com>
Sent: Friday, January 26, 2024 5:00 PM
To: Rudolf Schröder <Rudolf.Schroder@zutari.com>
Subject: Re: Welgevonden Planning advertisement

You don't often get email from pierre@suprafamilias.com. [Learn why this is important](#)

Thanx in broadstrokes what type of development is intended?

Pierre Greeff
 SUPRA FAMILIAS
 +2733906963

Skype: ekhoudaarvan

On Fri, 26 Jan 2024 at 16:19, Rudolf Schröder <Rudolf.Schroder@zutari.com> wrote:

Hi Pierre

The application can also be downloaded by following this link:

[https://www.dropbox.com/scl/fi/z12s2ui44fba9f699ilu6/Rezoning-and-Subdivision-Application-of-Erf7001-Stellenbosch Cloetesville-with-dividers .pdf?rlkey=jg1oao5gujxx81x5kuxb17t0a&dl=0](https://www.dropbox.com/scl/fi/z12s2ui44fba9f699ilu6/Rezoning-and-Subdivision-Application-of-Erf7001-Stellenbosch%20Cloetesville-with-dividers.pdf?rlkey=jg1oao5gujxx81x5kuxb17t0a&dl=0)

Please let me know if you have any questions.

Kind regards,

Rudolf Schröder *Pr. Pln, M.PMSA, MTRP*
 ASSOCIATE SPECIALIST | ZUTARI

M +27-833906963 **E** Rudolf.Schroder@zutari.com **W** zutari.com

DISCLAIMER

From: Pierre Greeff <pierre@suprafamilias.com>
Sent: Friday, January 26, 2024 3:05:37 PM
To: Rudolf Schröder <Rudolf.Schroder@zutari.com>
Subject: Welgevonden Planning advertisement

You don't often get email from pierre@suprafamilias.com. [Learn why this is important](#)

Hi Rudolf

The link included in writing to us as owners has a dead link:

<https://www.stellenbosch.gov.za/planning/documents/planning-notice/land-use-applications-advertisements>

Could u plz send it to me directly

Sal dit waardeer

Pierre

Pierre Greeff +27825649760

CONCERNS REGARDING PROPOSED DEVELOPMENT ADJACENT TO OUR PROPERTY

Melanie and Delarey Kahts

2 Squirrel Close, Cloetesville, 7600

Erf 13777

Mobile: 072 311 7139

Email: [redacted]@gmail.com // [redacted]@gmail.com

25 February 2024

Mr Rudolf Schröder

ZUTARI

George

Per email: Rudolf.Schroder@zutari.com

Dear Rudolph

**COMMENT ON THE LAND DEVELOPMENT APPLICATION: ERF 7001,
STELLENBOSCH**

(CLOETESVILLE HOUSING DEVELOPMENT)

We are writing to express our concerns regarding the proposed development adjacent to our property. As home owners of this neighbourhood with property bordering the planned development, we appreciate the need for growth and progress. However, we believe it is essential to strike a balance between development and preserving the existing quality of life for residents.

Our property is situated at the end of the current dead-end Tolbos road, and has unique features that were some of our only considerations before buying:

1. **Open Space (green space/belt):** Our property shares a border with a 6-hectare public open space to the west. This green area has provided the sense of nature and space. We were, in fact, placed under the impression that this area could not be developed as it's a zoned services delivery area and this would definitely have impacted on our decision to purchase the house.
2. **Limited Traffic:** The dead-end road leading to our home has ensured minimal traffic and noise. We have enjoyed the peace and security of living in a cul-de-sac, where pedestrians rarely pass by.
3. **Safety:** The absence of through traffic has made our neighbourhood safe. Few unrecognised vehicles would go unnoticed by residents. Without heavy traffic the road could also be enjoyed without the risk of accidents.

CONCERNS REGARDING PROPOSED DEVELOPMENT ADJACENT TO OUR PROPERTY

While this could be an important development to alleviate the accommodation shortage, we are concerned about the impact the proposed development will have on existing surrounding properties. Specifically, we would like to address the following points regarding the planned development under application reference LU /16572 and TP591/2023:

1. Increased Vehicle and Pedestrian Traffic:

- The opening of the dead-end road to accommodate the increased daily traffic will obviously have an impact on the normal daily proceedings. We anticipate gridlocks during peak hours, additional noise, and road safety risks for pedestrians, children and pets.
- Speeding and loud vehicles will have to be mitigated. Being accustomed to the cul-de-sac road that we stay on; the introduction of constant flowing traffic must be managed by means of speed bumps/humps to reduce noise and the risks of accidents as people and vehicles exist the estate. We therefore demand that traffic and speed control measures be implemented and officially stated as such before civil works or construction commences.
- Most importantly, reducing the required number of parking spaces per household would not be manageable. All surrounding properties have at least two vehicles, if not three. As it would be impossible for anyone to police the one vehicle per property and coupled with the lack of formal public transport it is expected that households would have more than one vehicle as proven around the neighbourhood. This would lead to vehicles parked on the street which would disrupt traffic flow and could be an attraction for petty crimes.

2. Water Pressure Issues:

- Our existing water pressure has been adequate but delicate under the current circumstances. The addition of more households could only exacerbate this issue.
- We urge the municipality to assess the water infrastructure carefully and ensure that the increased demand does not compromise water pressure for existing residents before any development commences.

CONCERNS REGARDING PROPOSED DEVELOPMENT ADJACENT TO OUR PROPERTY

3. Dust and Noise Control During Construction:

- Dust and noise from construction activities can disrupt neighbouring properties and families and people working from home. We request strict adherence to dust control measures and considerate working hours.
- Proper management of construction-related noise is crucial to maintaining the quality of life and health during this period.

4. Property Value Decrease Risks:

- The proposed development may impact property values in the area. We urge the developer to consider the long-term effects on existing homeowners.
- A decline in property values could have far-reaching consequences for owners and the municipality.
- We have first hand experience sharing a border with properties between Cloetesville and Welgevonden. The municipality has done nothing about structures being erected on the border wall. We would therefore request that servitudes be set up to prevent this backyard structures from imposing on the property line. It needs to be recorded as such on the Surveyor General diagram.
- Has the developer or municipality conducted a proper property value assessment and considered the impact on existing rental properties?

CONCERNS REGARDING PROPOSED DEVELOPMENT ADJACENT TO OUR PROPERTY

5. Privacy

- As these properties would be on a higher elevation than that of the lower laying erven, specifically erven situated in Squirrel Close we request that restrictions be placed on windows and balconies facing lower laying erven, especially on multi-storied properties.

We appreciate your attention to these matters and hope that the developer and municipality will take our concerns seriously. We believe that responsible development can coexist with the preservation of our neighbourhood's unique character.

Thank you for considering our input.

Sincerely,

Melanie and Delarey Kahts

Rudolf Schröder

From: Annelise Krige <akrige@gmail.com>
Sent: Thursday, 22 February 2024 15:03
To: Rudolf Schröder
Cc: Vincent Krige
Subject: Ontwikkelings aansoek LU/16572 en TP591/2023

You don't often get email from akrige@gmail.com. [Learn why this is important](#)

Goeie dag

Ek vertrou dat dit goed gaan.

Graag wil ek besware rig tot aansoek LU/16572 en TP591/2023 as volg:

- Bewaring van die park en bome wat help met "global warming" en kinders het nie eers meer plek om te speel
- Bewaring van die dam of reservoir
- Die toenemende verkeers druk wat die nuwe woonhede gaan veroorsaak
- Tekort aan Engels medium hoerskole in Stellenbosch gemeenskap

Baie dankie

Vriendelike groete

Annelise & Vincent Krige

7 Hendrikse Straat, Cloetesville, Stellenbosch,m 7600

Rudolf Schröder

From: Stellenbosch Interest Group <interestgroupstellenbosch@gmail.com>
Sent: Sunday, 25 February 2024 21:52
To: Rudolf Schröder
Cc: Stiaan Carstens; Patricia Botha; bertahayes
Subject: Cloeteville ERF 7001, SIG Comment
Attachments: Cloeteville Erf 7001 Proposal - SIG Comment Feb 2024.pdf

You don't often get email from interestgroupstellenbosch@gmail.com. [Learn why this is important](#)

Dear Mr Schröder

Please find attached comment by the Stellenbosch Interest Group.

Confirmation of receipt will be appreciated.

Kind regards
Berta Hayes (Secretary)

072 907 3520



Belangegroep Stellenbosch Interest Group

interestgroupstellenbosch@gmail.com

25-02-2024

Zutari, Attention Rudolf Shröder
rudolf.schroder@zutari.com

cc. Stiaan.Carstens@stellenbosch.gov.za

Dear Mr Shröder

Application for Rezoning, Subdivision, Consent Use, Departure and Closure of a Part of a Public Space, Erf 7001, Stellenbosch Reference Number LU/16572 and TP591/2023

Given the urgent need for GAP housing, the Stellenbosch Interest Group (SIG) supports the proposed development in principle. The SIG does, however, wish to raise the following concerns and make the following recommendation.

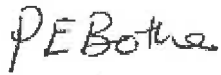
1. There is also an urgent need for public open spaces in Cloetesville. Some areas that may be considered public open spaces are for various reasons not suitable to be used as such. For instance, some are not safe for children.

In view of this, the SIG finds the part of the current erf reserved for public open spaces inadequate. It proposes that the single large open space proposed (the proposed Erf 202) be expanded to cover a larger area of around 1,5 hectares, and that the other open spaces also be enlarged (excepting the useless sliver of land that cannot be called a public open space). This is all the more important because the proposal asks for the relaxation of building lines. A crowded housing estate without adequate open spaces could easily become an urban slum.

2. Since the stated purpose is to provide housing for the people of Cloetesville, the new zoning regulations should be written so as to ensure that the development serves this purpose. For instance, student accommodation and/or communes should **not** be listed as subject to technical approval or consent use.
3. The possibility of turning the development into a gated village now or at a later time should be explicitly excluded. If this were to happen, the development would simply become an expansion of Welgevonden (the wall between the two being removed).

4. The SIG does not oppose the proposal that only one parking bay instead of two be provided per unit. Then, however, the use of the properties for any business purposes should explicitly be ruled out. If any of the properties were to be used in this way, it would create serious parking problems.
5. The SIG does not comment on the various options listed in the proposal, but asks that the views of the current residents of Cloetesville be heeded in this regard. This also goes for the proposed erection of a telecommunication mast and its location.

Kind regards

A handwritten signature in black ink, appearing to read 'PE Botha'.

Patricia Botha

Virdus Works (Pty) Ltd (Reg. No. 2018/585747/07)

Development Management Consultants and
Environmental Assessment Practitioners

Memorandum of Incorporation (MOC) 2018/585747/07

10, Tloane Square, Tloane Square, Cape Town, 7999

2018 South Africa

Mobile: +27 82 895 4300 / Email: info@virdusworks.co.za



19 February 2024

Mr Rudolf Schröder

ZUTARI

George

Per email: Rudolf.Schroder@zutari.com

Dear Rudolph

**COMMENT ON THE LAND DEVELOPMENT APPLICATION: ERF 7001, STELLENBOSCH
(CLOETESVILLE HOUSING DEVELOPMENT)**

The comment is submitted on behalf of the Welgevonden Home Owners' Association (WHOA) that represents abutting land owners to the north of the site and interested and affected parties who share the same municipal services infrastructure.

As an initial statement, the WHOA wants to make it clear that it is not opposed to the human settlement development and the provision of affordable housing opportunities for the residents of the Stellenbosch area and in particular for Cloetesville residents who have not had access to such opportunities. There are however aspects of the development which need to be clarified and the WHOA would like to comment thereon and make certain requests relating to the development proposal to ensure minimal potential negative effect on Welgevonden Estate and the members of the WHOA.

A. Human settlement

- a. Nature of the development. The WHOA specifically does not object to the development of affordable housing where properties are intended for disposal to qualifying purchaser's resident in Stellenbosch municipal area, and more so in Cloetesville, who do not qualify for full housing subsidies, i.e., earn more than the minimum household income of R3 500,00 per month and would make use of the so-called First Home Finance / FLISP programme to acquire a property.

If the project is in any way altered to cater for fully subsidised settlement development open to all households on the municipal waiting list, the WHOA will object to and oppose the proposed development.

- b. Retention of benefit. The Municipality should introduce the measures contained in the approved Inclusionary Housing Policy to ensure that the housing is retained as an affordable housing asset in the area. It must impose restrictive title conditions on all sales, containing at least a reversionary clause through which the first time and subsequent buyers cannot dispose of the properties for financial gain and revert to the same socially limiting / need position as before acquisition of the property. No owner of a property acquired in the development should be permitted to sell the property within the first eight

to 10 years of it being developed, unless back to the Municipality at its municipal valuation or to another qualifying buyer at an affordable value to be agreed to by the Municipality in terms of the said Inclusionary Housing Policy.

- c. Effect on surrounding community. The development focus must remain the reduction in need for affordable housing in Cloeteville, i.e., preference should be given to applicants / buyers from the Cloeteville area / Wards 10, 16 and 17. Failing to do so would cause an influx of residents into the area with obvious effect on the surrounding community, as detailed in the subsequent paragraphs. Not only will it skew the existing social characteristics of Cloeteville, but it will increase the demand for services which are already under strain.
- d. Property value. The houses in the surrounding area of Cloeteville and Welgevonden have significant value, which value retention is not only important for the owners but also for the Municipality, which generates rates and taxes on the basis thereof. The value of houses built in the development should be comparable to the value of the houses in the surrounding area. In view of the limited budgets and financial resources which would be available to the purchasers of the affordable housing, the Municipality should subsidise the land cost (price of erven) and thus maximise the resources available to the purchasers for house building. Considering that Erf 7001 was created in the 1970's when the forced relocation of the residents from Stellenbosch central area occurred, the Municipality incurred no cost in the acquisition of the land and should at worst recoup only the cost of servicing the land for the settlement to the extent that it is not subsidised by the provincial or national government.

B. Traffic and transport

- a. Congestion and levels of service. The residents of Welgevonden Estate endure the low levels of service as indicated in the traffic impact assessment (TIA) that forms part of the application documentation. The WHOA specifically opposes the notion that the levels of service at intersections in the surrounding area as indicated in the TIA paragraph 4.3 are acceptable. The levels of service (LOS) are not acceptable. Residents cannot be expected to accept LOS D - E with queueing and driver discomfort as acceptable. Any addition to the traffic, even pedestrian movement, will cause further lowering of the intersection LOS, especially at the closest and main intersections where traffic can gain access to the main feeder routes such as the R44, and the R304 that is in any event indicated for upgrading / improvement.
- b. Non-motorised transport provision. Pedestrian routes, non-motorised transport (NMT) routes, and public transport facilities in the surrounding area and along the main feeder / commuter routes have to be created and upgraded as part of the project. It is a recommendation of the TIA under paragraph 4.3, but experience has shown that such NMT and pedestrian facilities are under-valued and that they are seldom effectively developed. The Municipality must commit to the upgrading of the NMT routes together with services construction in the development.

C. External services

- a. Potable water system. Parts of Welgevonden experience periodic water pressure problems, related to the combined effect of low reservoir capacity, loadshedding, and inability of the reservoir feeder pumps and pipes to supply sufficient water to the reservoirs in between

loadshedding cycles. It can be expected that the proposed development, which is at a higher level than most of Welgevonden, will be even more disadvantaged and affected by the situation. Moreover, by adding the additional consumers, the effect on Welgevonden will be more pronounced.

The network upgrade recommendations under paragraph 5.1.1 of the Civil Services Report must be implemented before the development of the housing commences. The current approved municipal capital budget seems completely inadequate for the required upgrades. While not directly part of the process, the Municipality should provide sufficient funding in its 2024-25 and subsequent budgets to provide for the construction of the new reservoir and the upgrading of the related networks and systems to avoid the potable water supply shortcomings which affect the neighbourhoods around the development.

- b. Stormwater. The northwards drainage of stormwater through the Tolbos system and through Welgevonden places a risk on the Welgevonden residents. There must be appropriate provision for high intensity run-off and climate change effects to avoid localised flooding of the Welgevonden infrastructure and properties. The Welgevonden systems were not designed with capacity for any development on the subject property and resulting increased run-off, or for the effects of climate change, which are already placing stress on the systems. The current stormwater plans and designs need to be re-evaluated to ensure appropriate capacity in the system.

D. Layout

- a. Layout plan. The layout makes good provision for the intended development and contains thoughtful detail, such as the clustering of rowhouses. On the other hand, it should be more considerate of the existing Welgevonden residences, especially on the northwestern side (preferred layout erven numbers 167 – 170 and 199 – 201). The 8m-wide dead end along layout number 205 can be widened, to incorporate the water pipeline into the road reserve and a line of erven can be provided there on erf 205. This amendment would yield at least 13 erven, while leaving an open space buffer on the Hendrikse Street side of erf 205. It would also allow for erven 167 – 170 to be planned as a consolidated erf for a crèche, or as two larger residential erven such as those in Gabriels Street. It would further allow for erven 199 – 201 to be used for open space with erf 202 or as two larger residential erven such as provided along Tolbos.
- b. Servitude provision. Experience along other boundaries of Welgevonden shows that the owners of the Cloetesville properties establish informal dwellings in the backyards abutting the Welgevonden fence and properties. This creates an undesirable situation, not only with negative effect on the property values of the abutting Welgevonden properties, but also on the health and well-being of the Welgevonden neighbours, not to mention the situation of the residents of these informal accommodation units. To avoid such occurrence of backyard settlement, it is proposed that servitudes to prevent the construction of informal structures used for human habitation or accommodation be registered in favour of the WHOA over all residential erven abutting the Welgevonden boundary. The servitudes need to be imposed as personal servitudes in favour of the WHOA and worded in such manner as to restrict any human habitation in any informal structure and any informal structures from being erected in the backyards of properties abutting the Welgevonden properties. Such servitude and title restrictions will allow the WHOA to act against any contravening owner, in view of the lack of capacity and success

of the Municipality to enforce its Bylaws in such instances.

E. Environmental aspects

- a. Socio-economic. The main elements of the comment regarding the social and economic aspects of the proposal have been discussed briefly above. Suffice to state that the development should not be used as an opportunity to disrupt the receiving community by allowing non-residents of the community to acquire subsidised property in Cloetesville. The development should respect the local community and future residents by building in appropriate measures to maintain the value of the surrounding properties and by retaining the benefit of the development as an affordable housing project for Cloetesville residents and prevent gentrification.
- b. Bio-physical. The bio-physical environment consists of the mature trees which have become a landmark, albeit alien vegetation. These trees need to be removed to prevent risks associated with mature pine trees in a disrupted environment and for purposes of the development. In their place the Municipality should plant appropriate indigenous trees of a size that would make it impossible for them to be removed by hand. Such semi-mature trees will soon provide a green cover for the streets and soften the effect of new housing in the development, as well as create a welcoming natural environment for the new residents.

The above comment on behalf of the WHOA is submitted on the understanding that it will be considered in the process and that a serious attempt will be made by all parties concerned to incorporate them in the proposed development plan.

Yours faithfully

DUPRÉ LOMBAARD

(SACPLAN B/8076/1998 // EAPASA 2019/304)

Rudolf Schröder

From: Dean Phillips <deanphillips33@gmail.com>
Sent: Monday, 05 February 2024 17:51
To: Rudolf Schröder
Cc: Shaun October
Subject: Comments on land use. Perfect 7001 stellenbosch.

You don't often get email from deanphillips33@gmail.com. [Learn why this is important](#)

NO! Project.

23 February 2024

Mr Rudolf Schröder
ZUTARI
George
Per email: Rudolf.Schroder@zutari.com

COMMENT ON THE LAND DEVELOPMENT APPLICATION: ERF 7001, STELLENBOSCH (CLOETESVILLE HOUSING DEVELOPMENT)

The comment herein is submitted on behalf of the residents of Squirrel Close. Most of the affected residents in Squirrel Close are abutting land owners to the east of the site and they are interested and affected parties who share the same municipal services infrastructure.

The Squirrel Close Homeowners' Association Trustees note the circulars of the Stellenbosch Municipality that came to the attention of the Trustees on 5 February 2024

- a. NOTICE OF LAND DEVELOPMENT APPLICATION TO INTERESTED AND AFFECTED PARTIES FOR COMMENT
- b. NOTICE OF LAND DEVELOPMENT APPLICATION IN THE STELLENBOSCH MUNICIPAL AREA NOTICE NUMBER: 4/2024 APPLICATION FOR REZONING, SUBDIVISION, CONSENT USE, DEPARTURE AND CLOSURE OF A PART OF A PUBLIC SPACE OF ERF 7001 STELLENBOSCH

The Trustees would like to make the following respectful submission that the Municipality's decision should be informed by.

COMMENTS

- 1) We are in support of the proposed land development adjacent to Squirrel Close – if the concerns indicated below are addressed and satisfied. We follow the viewpoint of A. Evetts of Squirrel street No 14: "It will cut down on vagrants and other illegal operations taking place there and it is appreciated that thought and planning has been done around maintaining a fair amount of natural trees / habitat. As stated in the application document, it will avoid possible land invasions and more importantly supply housing that is in short supply. It can uplift and enhance the whole area."
- 2) "The Development Application seems to be well researched and it is re-assuring that it seems to be sensitive to the bordering Estates and that the developers are wanting to mirror the feel and ambiance of both Welgevonden and Squirrel Close. The proposed buildings and road "feel" depicted schematically in the planning application, look similar to the current existing estates."
 - We propose that the architectural style indeed reflect the bordering estates as well as their styling rules with regards to colour palette, renovation and additions, and overall architecture.
- 3) We find your overall spatial planning as reflected in figure 31 on page 38 provisionally the most acceptable from our point of view in that there is no road running directly against the boundry of Squirrel Close which could be a security risk (albeit the erven sizes and building detail are unfavorable as set out more specifically below).
- 4) In general, we are in agreement with the Comment on the Land Development Application: Erf 7001, Stellenbosch (Cloeteville Housing Development) submitted by the Welgevonden Home Owners Association (WHOA) dated 22 February 2024.

CONCERNS REGARDING PROPOSED LAND DEVELOPMENT DOCUMENTS

- 1) Property value. The proposed land development has prompted the cancellation of at least one property sale in Squirrel Close, which is concerning. Given that many properties within Squirrel Close were purchased prior to the conception of this development, it is imperative that any development be zoned, designed, and executed in a manner that avoids detrimental effects on existing property values.
- 2) Building detail. In the proposal, smaller erven sizes are designated for the plots bordering Squirrel Close, while larger erven are allocated along the border with Welgevonden Estate. Additionally, the proposal suggests the construction of a continuous block of Row Housing/Apartments adjacent to the boundary wall of Squirrel Close. Such a plan is deemed unacceptable as it would result in a substantial building looming over Squirrel Close, significantly altering the overall

character of the area. The proposed buildings appear to be in close proximity to the shared boundary of existing properties, a factor that would undoubtedly diminish the property values in Squirrel Close—a scenario that is unacceptable.

The documents seek authorization for the removal or reduction of building line restrictions. This prospect raises concerns among residents of Squirrel Close. Therefore, it is strongly requested that any building stipulations refrain from including any reductions in building lines for the new development, particularly concerning the boundary lines between the new development and properties in Squirrel Close. Consequently, it is imperative that a building restriction of three to five meters be upheld between the new residential units and the boundary line of Squirrel Close.

The following building restrictions should be adhered to for all erven abutting to Squirrel Close:

- DETACHED OR SEMI-DETACHED housing
 - Erven size of minimum 200m²
 - A maximum of 50% building coverage
 - A 3-5 meter boundary building line adjacent to the Squirrel Close boundary line
- 3) Servitude provision. Experience along other boundaries of Welgevonden shows that the owners of the Cloetessville properties establish informal dwellings in the backyards abutting the Welgevonden fence and properties. This creates an undesirable situation, not only with negative effect on the property values of the abutting Welgevonden properties, but also on the health and well-being of the Welgevonden neighbours, not to mention the situation of the residents of these informal accommodation units. To avoid such occurrence of backyard settlement, it is proposed that servitudes to prevent the construction of informal structures used for human habitation or accommodation be registered in favour of the erven in Squirrel Close regarding erven abutting the Squirrel Close boundary. The servitudes need to be imposed as personal servitudes in favour of the erven in Squirrel Close that boundries on the new development and worded in such manner as to restrict any human habitation in any informal structure and any informal structures from being erected in the backyards of properties abutting the Squirrel Close properties. Such servitude and title restrictions will allow the owners of Squirrel Close properties abutting the new development to act against any contravening Cloetessville owner, in view of the lack of capacity and success of the Municipality to enforce its Bylaws in such instances.
 - 4) Traffic and transport: Congestion and levels of service. The residents of Welgevonden Estate endure the low levels of service as indicated in the traffic impact assessment (TIA) that forms part of the application documentation. The WHOA specifically opposes the notion that the levels of service at intersections in the surrounding area as indicated in the TIA paragraph 4.3 are acceptable. The levels of service (LOS) are not acceptable. Residents cannot be expected to accept LOS D - E with queueing and driver discomfort as acceptable. Any addition to the traffic, even pedestrian movement, will cause further lowering of the intersection LOS, especially at the closest and main intersections where traffic can gain access to the main feeder routes such as the R44, and the R304 that is in any event indicated for upgrading / improvement.
 - 5) External services: Potable water system. Periodic water pressure problems, related to the combined effect of low reservoir capacity, loadshedding, and inability of the reservoir feeder pumps and pipes to supply sufficient water to the reservoirs in between loadshedding cycles are experienced. It can be expected that the proposed development, will be even more disadvantaged and affected by the situation. Moreover, by adding the additional consumers, the effect will be more pronounced. The network upgrade recommendations under paragraph 5.1.1 of the Civil Services Report must be implemented before the development of the housing commences. The current approved municipal capital budget seems completely inadequate for the required upgrades. While not directly part of the process, the Municipality should provide sufficient funding in its 2024-25 and subsequent budgets to provide for the construction of the new reservoir and the upgrading of the related networks and systems to avoid the potable water supply shortcomings which affect the neighbourhoods around the development.

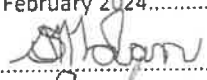
QUESTION

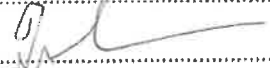
The development is presented as a public housing area with open access. Is anything like a closed, security area for this development on the cards?

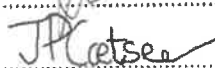
Since individual members of the Squirrel Close Home Owners association may have additional comments, we confirm that such members are at liberty to provide the Municipality with their own comments.

Signed by the Trustees of the of Squirrel Close Homeowners' Association, Stellenbosch

Date.....23 February 2024.....Place: Stellenbosch

1..........Name:.....Sophia Malan.....

2..........Name.....Johan van der Merwe.....

3..........Name.....Jaco P. Coetsee.....

Rudolf Schröder

From: Wesley Dewing <wesdewing@gmail.com>
Sent: Saturday, 24 February 2024 20:49
To: Rudolf Schröder
Cc: Jade North
Subject: Comment on Land Development Application: Erf 7001, Stellenbosch

You don't often get email from wesdewing@gmail.com. [Learn why this is important](#)

Dear Rudolf

As the owners of 29 Belladonna in Welgevonden Estate and party therefore directly impacted by the proposed development of Erf 7001, please find our input, objections and alternative suggestions as response to this application:

1. We are very concerned that the proposed development will unfortunately have a detrimental effect on the value of our only property and also those of all other surrounding properties. As is the case for most middle and lower middle class people, this asset is financed by a mortgage with a high interest rate, that we are repaying over a 20 year period. It forms the basis of all our savings. We are a single income household and can not afford our only asset to devalue.
2. Further to this, this devaluation in the property value will also filter through to the municipal valuations, resulting in decreased municipal income through taxation.
3. We therefore have to object to the *format* of the development. We do not however object to the erf being developed.
4. We argue that placing additional low value housing (GAP housing) on this side of town also perpetuates the outdated, politically incorrect and unacceptable view that "the poor" live on this ("wrong") side of Stellenbosch. We fundamentally oppose the perpetuation of this perception.

We have two alternative suggestions for erf 7001, followed by a compromise alternative suggestion. The first two will result in a much higher financial return for the municipality of Stellenbosch, which in turn will enable the municipality to develop even more affordable housing units in a different and perhaps even more central location:

1. Sell the erf to a developer that intends to develop housing units more in line with the surrounding properties (R1 million+ units). This will be a win-win solution for the surrounding community and the municipality, as the additional funds can finance more housing units and therefore supply housing to more families in need, while protecting the asset values of the surrounding communities of Cloetesville, Welgevonden and Klein Welgevonden.

2. Sell the erf to Welgevonden Estate or developers interested to cooperate with Welgevonden Estate: infrastructure in the form of roads towards the park already exist inside Welgevonden Estate in parts. It should therefore be quite easy to incorporate erf 7001 with Welgevonden. This will generate even more revenue for the municipality, both in the form of capital upfront, as well as higher municipal tax rates. Once again this will not have a detrimental effect on the surrounding property values, as the housing units will be within the range of R1.5 million+ value bracket.

If money is in fact not the object for Stellenbosch's municipality and the object is increased societal integration, a compromise alternative suggestion is to give consideration to increasing the price range of proposed units e.g. instead of only units spanning from R250 000 to only R750 000, we propose that the development includes a larger mix of housing spanning a larger price range for example R250 000 to R2 million+. This increased mix of housing will somewhat mitigate the negative perception that impacts the surrounding asset prices, while increasing social integration even more.

In addition, we fully support the initiative of developing a more integrated society and providing housing to those in need. We propose that these developments are rather placed in areas where the surrounding communities can afford the devaluation of their properties i.e. the rich upper class, while offering the people in need a better life and also promoting a more balanced and integrated society. This is something that is sorely needed in Stellenbosch. Please see the relevant maps below the text of the email. To name but a few examples:

1. Mostertsdrif - the erf at the corner of Rowan Str and Jannasch Str. This erf is close to Stellenbosch High School, close to Stellenbosch CBD with the additional benefit that it borders the Mill Stream and is close to Stellenbosch Mountain.
2. Uniepark - there are a number of large green spaces in Uniepark. This location offers many of the same benefits as Mostertsdrif.
3. Onder Papegaaiberg - again a number of large green spaces much closer to Stellenbosch CBD.
4. Die Boord - specifically the green space next to Rhodes-Noord Rd. This location is again centrally located, close to the R44 for easy access to public transport, Boord Spar and close to Rhenish High and Primary, as well as Eikestad Primary, Bloemhof and Paul Roos. A prime location to offer those in need a better life.
5. Dalsig and Brandwacht - a number of open spaces in a neighbourhood of houses in the region of R8 million each, the privileged few who can definitely afford a devaluation in their property values.

Further, current traffic congestion into and out of Welgevonden during peak hours is already unacceptable, to even consider an additional development such as this without first fully addressing this shortcoming, is complete negligence on the side of the municipality.

We trust that you will reconsider and revise your proposal to take into account the negative impact on the lower-middle/middle class.

Best regards,

Wesley Dewing and Jade North-Dewing

Owner erf 14235 (Belladonna 29) that borders erf 7001

Rudolf Schröder

From: Winston Barends <barendswinston@gmail.com>
Sent: Wednesday, 21 February 2024 19:53
To: Rudolf Schröder
Subject: Besware_Erf 7001 _Hendricksestraat Cloeteville, Stellenbosch

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Beste Rudolf Schroder

Aanvaar hiermee my beswaar met betrekking tot die nuwe ontwikkeling, Erf 7001, Hendricksestraat Cloeteville, Stellenbosch.

1. Bogenoemde ontwikkeling sal 'n invloed hê met betrekking tot ons eiendom waardasie.
2. Die verkeer sal toeneem.
3. Struktuur wat op erwe gebou gaan word waar nog mense kan woon (wendyhuise ens).

Kan u bevestig of bogenoemde erf in 'n plakkerskamp gaan ontstaan? Baie areas met hierdie tipe ontwikkeling lyk tans soos 'n plakkerskamp.

Die inwoners te Hendricksestraat is ongelukkig met die ontwikkeling en ons het almal se ondersteuning.

Dankie.

Groete
 Wilfred en Winston Barends
 081 841 8836 / 082 967 8261



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Hendricksestraat 2 (Erf 8963)
Cloetesville
Stellenbosch 7600

25 Februarie 2024

Mnr Rudolf Schröder
E-posadres Rudolf.schroder@zutari.com
Zutari (Edms) Bpk

Zutari se Aansoek om Hersonering, Onderverdeling, Toestemmingsgebruik, Afwyking en Sluiting van 'n Gedeelte van die Openbare Ruimte van Erf 7001 te Stellenbosch: Aansoekverwysing: LU/16572 en TP591/2023

Hiermee maak ek namens myself en inwoners van Hendricksestraat, Cloetesville ten sterkste beswaar teen Zutari se aansoek om die hersonering, onderverdeling, toestemmingsgebruik, afwyking en sluiting van 'n gedeelte van die openbare ruimte van erf 7001 te Cloetesville.

Hierdie gedeelte van Cloetesville is nie alleen die beste gedeelte van Cloetesville nie, maar 'n rustige en betreklik stil buurt waarvan verreweg die meeste erwe groter as 500 m² is en die huise ruim gesinshuise met motorhuise, tuine en ander ruimtes is. Die meeste wonings is die eienaars se grootste enkele belegging.

Nou wil u 'n ekonomiese ontwikkeling in die middel van ons stil, rustige buurt plaas en boonop die grootste gedeelte van 'n openbare oop ruimte daarvoor aanwend. Dis die verkeerde plek vir so 'n ontwikkeling. Ons is nie teen ontwikkeling gekant nie, maar die korrekte ontwikkeling vir hierdie area sou normale grootte erwe met gesinshuise wees; beslis nie 201 posseëlgrootte erfies met piepklein strukture daarop wat soos hare op 'n hond se rug ingeryg is nie.

Uit ervaring in ander woongebiede waar die munisipaliteit ook hierdie tipe ontwikkelings toegelaat het, sal elke struktuur en meegaande agterplaasruimtes deur minstens 4 tot 8 persone bewoon word. U kan self die som maak.

Die bogenoemde skep die indruk dat u eensydig besluit het dat die huidige inwoners maar verlief moet neem met die volgende, wat onvermydelik is:

- die oorbevolking van so 'n digs ontwikkelde, ekonomiese buurt,
- die verkeersdrukte wat daarmee gepaard gaan en waarvan die meeste via Hendricksestraat na die nuwe ontwikkeling gelei sal word,
- die geraas wat met so 'n digs bevolkte ontwikkeling gepaard gaan,
- die verhoogde risiko van misdaad soos diefstal, rommelstrooiery, ens. wat met so 'n digs bevolkte en ekonomiese ontwikkeling gepaard gaan, en
- laastens, die waardevermindering van ons eiendom wat aan 'n ekonomiese ontwikkeling grens met al die gepaardgaande probleme soos hierbo uiteengesit.

Boonop skep u aansoek die indruk dat die inwoners van Cloetesville nie 'n behoorlike oop ruimte vir 'n park, braaiplekke, ens. mag hê nie. Die beplande groen spasie op u voorgestelde kaart is uiteraard hopeloos te klein om Cloetesville te diens; dus kon u dit maar weggelaat het.

'n Mens kan nie help om te wonder hoe dit moontlik is dat so 'n verregaande plan op die beste deel van Cloetesville afgedwing kan word nie.

MP Beukes

Rudolf Schröder

From: Ron Parnell <ronparnell77@gmail.com>
Sent: Thursday, 29 February 2024 15:13
To: Rudolf Schröder
Cc: Ian Lourens; manager@welgevonden.co.za
Subject: Rezoning Application Consultation: ERF 7001

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Application: LU/16572 and TP591/2023

To whom it my concern

I am the owner of Erf 14240 - 19 Belladonna, Welgevonden Estate. The proposed rezoning would have a direct impact on my property boundary so there are a number of observations and objections that I wish to raise. I have highlighted specific questions associated with a range of anxieties regarding the particular implementation of proposals, and specifically the high density ambitions for the development.

The building line changes that allow for **maximum** residential development will detrimentally impact on the overall residential and environmental experience of residents in Belladonna Street and beyond. The scale of development is very much at odds with the nature of development on the established Welgevonden side of the boundary. The direct impacts of numbers of people, and vehicles, and resultant additional noise, including from so-called recreational space would not be desirable.

Vehicle numbers also will have a negative impact on local parking and access to main routes into town. Already unprecedented levels of housing development in the immediate area surrounding Welgevonden together with the huge R304 'new town' are going to add to the growing crisis on our roads. Peak traffic flow is already at impossible levels; previously simple journeys to town, business and schools are now severely compromised. And, any expectation of being able to travel through town to/from Somerset West and beyond is just not sustainable. It appears that NO consideration is being made to manage this explosion of local development. I would be pleased to know **what mitigations are being proposed to improve day to day transport options via the R44 and 304?**

On the matter of sustainability, health and environment, could you tell me **by how much the level of dangerous vehicular emissions in Stellenbosch has risen** over the past 5 years or more, and what the projections are for the future?

If development must occur, and people need houses, then it must still be done with sensitivity to sustainability issues and lifestyle considerations of current residents. In respect of rezoning of ERF 7001 the relaxation of building lines would not be acceptable and simply exacerbate current problems.

The stated justification for reduced parking need - i.e. the lower socio-economic standing of the target market is hardly good news for those assuming any new adjacent development to be in sympathy with the 'market' on the other side of the boundary.

In respect of other direct impacts on my property I do not have sufficient information about the plans for recreational areas, and in particular the dam, to the area adjoining my boundary wall. A dam might sound attractive. However, **I would like to know how this is to be maintained; is it going to be standing of through-flow water? What data is available on flood and surge water on all the properties below this area?** Also the last thing want is stagnant water creating a breeding ground for insects/mosquitoes and it seems more likely that this would be the case than not.

If this space is 'recreational' I should wish to know **what sort of usage is envisaged? Will unacceptable behaviour/nuisance be managed, plantings maintained, and litter collected?** Given the profile of your 'target market' it appears that we might expect very little in the way of high value maintenance of such amenity space. We know on Welgevonden the costs associated with such maintenance. **Will the municipality/developers ensure finance is set aside for the upkeep of the common spaces?**

On matters of security, I would wish to see some **guarantee that no building or plantings will degrade the currently robust and effective boundary security** paid via Welgevonden levies. Will there also be a commitment that **no additional informal dwellings will be permitted either within the grounds of new build properties or indeed on the anticipated communal spaces?**

I am currently paying expensive levies to enjoy well maintained facilities and guaranteed standards form neighbouring properties at the front of my house, so this will be poor investment if the reverse is true at the rear of my property, impact on property values notwithstanding.

Welgevonden residents are already facing impacts from development on this northern fringe of town at Weltreveden, Gevonden, Newinbosch, Volaire and so on. It is simply worth highlighting the fact that this is yet another project to be assimilated. If we then consider the other innumerable developments in Stellenbosch south and central with seemingly no consideration to longer term sustainability of services and infrastructure it begs the question about how the glamorous lifestyle marketing currently promoted by developers can ever be achieved. For many this ambitious programme of boom to growth is bringing increasing dissatisfaction with travel, parking and access to amenities and services. If there is a detailed strategic town plan for the future I would be pleased to see it.

Thank you for your attention to my concerns and observations.

Yours sincerely,

R G Parnell

19 Belladonna

Rudolf Schröder

From: Beukes, Ronel Beukes [mailto:rbeukes@sun.ac.za] <rbeukes@sun.ac.za>
Sent: Sunday, 25 February 2024 20:54
To: Rudolf Schröder
Subject: U aansoek vir grondontwikkeling: verw LU/16572 en TP591/2023
Attachments: Erf7001_Stellenbosch_Beswaar.pdf

You don't often get email from rbeukes@sun.ac.za [Learn why this is important](#)

Hierby aangeheg is 'n brief waarin beswaar aangeteken word teen Zutari se aansoek om grondontwikkeling te Cloetesville, Stellenbosch.

MP Beukes
rbeukes@sun.ac.za

The integrity and confidentiality of this email are governed by these terms. [Disclaimer](#)
Die integriteit en vertroulikheid van hierdie e-pos word deur die volgende bepalinge bereel: [Vrywaringsklousule](#)

Objection and comment to application LU/16572 and TP591/2023

Applicant: Zutari (for attention Rudolf Schröder)

Application Reference: LU/16572 and TP591/2023

Objection lodged by:

Ms. Scarlett Cornelissen

Affected party

Erf 14228 Stellenbosch

8 Wildeklawer Street

Welgevonden Estate

Stellenbosch

7600

Email: scarletta.sc@gmail.com

Tel: 082 598 4680

As affected party to application LU/16572 and TP591/2023, I submit an objection to the application for the rezoning, subdivision, consent use, departure and closure of part of a public space of Erf 7001 Stellenbosch.

The objection and reasons are stipulated below.

1. **Objection to the rezoning of Erf 7001 Stellenbosch from 'public open space' to a 'sub-divisional area' for the use of 201 conventional residential zone erven; 5 public open space zone erven; 1 utility services zone erf; and public road and parking zone, on the basis of the resultant densification, greater congestion and attendant increased impact on infrastructural use in that and affected (surrounding) areas.**
 - a. The rezoning of the public open space and use of Erf 7001 for human settlement and residential purposes will lead to greater residential density, greater congestion of road and transport routes and place strain on existing vital infrastructure such as water and sanitation and electricity provision.
 - b. There will be the need for the expansion of infrastructure as well as basic municipal services, including sewage and refuse removal, in that and affected areas, that can lead to an increase in municipal rates and tariffs.
 - c. These potential impacts specified at (a) and (b) do not align with the concept of 'sustainable and integrated human settlements' which underpins the Provincial Spatial Development Framework (as stated on p. 51 of the Application).
 - d. The number of erven to be zoned for residential purpose and the dwelling types applied for are aimed at maximising the number of households/residents to be housed. This adds to the densification impact. It does not support the Provincial settlement objective to 'protect and enhance sense of place and settlement patterns' (p. 51 of the Application), nor does it contribute to the dignity of the residents of such a settlement arrangement.

- e. The densification of the site is accompanied by loss of recreational space for the residents of the affected areas.
2. **Objection to application to the closure of part of a public space (Erf 7001 Stellenbosch) on basis of lack of specification of intended use of that space and contradictory detail of zoning use of Erf 12214 in Application.**
 - a. The Application submits for the closure of part of a public space (Erf 7001 Stellenbosch) which on p. 44-45 is identified as Erf 12214.
 - b. It is not specified to what use the closed public space will be put.
 - c. There is contradictory detail regarding the zoning use of Erf 12214 in the Application.
 - i. At section 3.5 entitled 'Preferred Development Concept' (p. 33) and Figure 31 (p. 34), it is indicated that Erf 12214 is not to be zoned for residential erven.
 - ii. At section 4.3 (p. 42) and Figure 39 (p. 43), Erf 12214 is indicated to be zoned for residential erven.
 - d. Accurate and consistent information on the detail and extent of zoning is required in an Application of this nature in order for affected parties to determine how they are to be affected and for affected parties to make the necessary informed decisions. There is lack of consistency in the information provided in the Application.
 3. **Objection to the incomplete environmental impact assessment accompanying the Application and lack of attention to potential ecological impact of development.**
 - a. In accordance with current national regulations, the Western Cape Department of Environmental Affairs and Development Planning found that environmental authorisation is not required for the development. However, this finding is on the basis of the loss of indigenous vegetation and the transformation of the vegetation through human use over time. This disregards the environmental and climate change mitigation role that the existing trees and vegetation, albeit non-indigenous, play.
 - b. No assessment has been done on the ecology that the existing site supports. This includes fauna, birdlife and insects. Changing the land use for dense human settlement can have ecological impacts on the affected areas and potentially the surrounding agricultural activities, that have not been assessed at all in the Application.

It is for the reasons specified above, that I object to the Application being approved.

Comments:

- a) Application for consent use to erect a telecommunications mast on the portion to be zoned as Public Open Space Zone (Erf 205)
 - a. The motivation for this application is stated as follows (p. 45): 'The main purpose of the proposed telecommunication mast infrastructure is to improve the telecommunication network capacity of the area thereby facilitating economic trade in goods by bringing together buyers and sellers, but more importantly, also promote trade in services upon which modern economies are built. Communication is therefore essential for economic growth.'

It is not clear how this is relevant to the proposed development, which is for a residential area. The proposed zoning of the mast, at a very visible site of Erf 7001 does not take factors of aesthetics into consideration. Once more, the dignity of the potential residents of the proposed low-cost housing units seems to be disregarded.

b) Housing Precedent

The images used to illustrate the 'Housing Precedent' (Section 3.6.1, pp. 36-39) seem to be of dwellings typical to higher income residential areas. Using such images to depict potential housing types for lower income housing as applied for, is misleading and borders on deception.

Sincerely,
Scarlett Cornelissen

Rudolf Schröder

From: Scarlett Cornelissen <scarletta.sc@gmail.com>
Sent: Saturday, 24 February 2024 15:50
To: Rudolf Schröder
Subject: Objection and comment to application LU/16572 and TP591/2023
Attachments: Objection and comment to application LU.docx

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Objection and comment to application LU/16572 and TP591/2023

Applicant: Zutari (for attention Rudolf Schröder)
 Application Reference: LU/16572 and TP591/2023

Objection lodged by:
 Ms. Scarlett Cornelissen
 Affected party
 Erf 14228 Stellenbosch

8 Wildeklaar Street
 Welgevonden Estate
 Stellenbosch
 7600
 Email: scarletta.sc@gmail.com
 Tel: 082-598-4680

As affected party to application LU/16572 and TP591/2023, I submit an objection to the application for the rezoning, subdivision, consent use, departure and closure of part of a public space of Erf 7001 Stellenbosch.

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- a. The rezoning of the public open space and use of Erf 7001 for human settlement and residential purposes will lead to greater residential density, greater congestion of road and transport routes and place strain on existing vital infrastructure such as water and sanitation and electricity provision.
- b. There will be the need for the expansion of infrastructure as well as basic municipal services, including sewage and refuse removal, in that and affected areas, that can lead to an increase in municipal rates and tariffs.
- c. These potential impacts specified at (a) and (b) do not align with the concept of 'sustainable and integrated human settlements' which underpins the Provincial Spatial Development Framework (as stated on p. 51 of the Application).
- d. The number of erven to be zoned for residential purpose and the dwelling types applied for are aimed at maximising the number of households/residents to be housed. This adds to the densification impact. It does not support the Provincial settlement objective to 'protect

and enhance sense of place and settlement patterns' (p. 51 of the Application), nor does it contribute to the dignity of the residents of such a settlement arrangement.

e. The densification of the site is accompanied by loss of recreational space for the residents of the affected areas.

2. Objection to application to the closure of part of a public space (Erf 7001 Stellenbosch) on basis of lack of specification of intended use of that space and contradictory detail of zoning use of Erf 12214 in Application.

a. The Application submits for the closure of part of a public space (Erf 7001 Stellenbosch) which on p. 44-45 is identified as Erf 12214.

b. It is not specified to what use the closed public space will be put.

c. There is contradictory detail regarding the zoning use of Erf 12214 in the Application.

i. At section 3.5 entitled 'Preferred Development Concept' (p. 33) and Figure 31 (p. 34), it is indicated that Erf 12214 is not to be zoned for residential erven.

ii. At section 4.3 (p. 42) and Figure 39 (p. 43), Erf 12214 is indicated to be zoned for residential erven.

d. Accurate and consistent information on the detail and extent of zoning is required in an Application of this nature in order for affected parties to determine how they are to be affected and for affected parties to make the necessary informed decisions. There is lack of consistency in the information provided in the Application.

3. Objection to the incomplete environmental impact assessment accompanying the Application and lack of attention to potential ecological impact of development.

a. In accordance with current national regulations, the Western Cape Department of Environmental Affairs and Development Planning found that environmental authorisation is not required for the development. However, this finding is on the basis of the loss of indigenous vegetation and the transformation of the vegetation through human use over time. This disregards the environmental and climate change mitigation role that the existing trees and vegetation, albeit non-indigenous, play.

b. No assessment has been done on the ecology that the existing site supports. This includes fauna, birdlife and insects. Changing the land use for dense human settlement can have ecological impacts on the affected areas and potentially the surrounding agricultural activities, that have not been assessed at all in the Application.

It is for the reasons specified above, that I object to the Application being approved.

Comments:

a) Application for consent use to erect a telecommunications mast on the portion to be zoned as Public Open Space Zone (Erf 205)

a. The motivation for this application is stated as follows (p. 45): 'The main purpose of the proposed telecommunication mast infrastructure is to improve the telecommunication network capacity of the area thereby facilitating economic trade in goods by bringing together buyers and sellers, but more importantly, also promote trade in services upon which modern economies are built. Communication is therefore essential for economic growth.'

It is not clear how this is relevant to the proposed development, which is for a residential area. The proposed zoning of the mast, at a very visible site of Erf 7001 does not take factors of aesthetics into consideration. Once more, the dignity of the potential residents of the proposed low-cost housing units seems to be disregarded.

b) Housing Precedent

The images used to illustrate the 'Housing Precedent' (Section 3.6.1, pp. 36-39) seem to be of dwellings typical to higher income residential areas. Using such images to depict potential housing types for lower income housing as applied for, is misleading and borders on deception.

Sincerely,
Scarlett Cornelissen



STELLENBOSCH

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MUNISIPALITEIT • UMASIPALA • MUNICIPALITY

Nov2023

DIRECTORATE: PLANNING & ECONOMIC DEVELOPMENT

www.stellenbosch.gov.za/planning-portal/

SUBMIT COMPLETED FORM TO RELEVANT LAND USE MANAGEMENT ADMINISTRATOR

LAND USE PLANNING APPLICATION: PUBLIC PARTICIPATION PROCESS							
PORTFOLIO OF EVIDENCE (POE) CHECKLIST AND DECLARATION							
Sections 45, 46 and 55 of the Stellenbosch Municipal Land Use Planning By-Law							
Erf / Farm no	7001	Portion(s) if farm		Allotment Area	Stellenbosch		
Owner/ Applicant	Stellenbosch Municipality			LU/#	LU/16572		
Notice Period	From:	25 January 2024	To:	5 March 2024			
CONFIRMATION OR DOCUMENTATION SUBMITTED				OWNER/APPLICANT			ADMIN VERIFY
				YES	NO	N/A	
1. The declaration is duly signed				✓			
2. Applicant confirms that the public participation process was duly undertaken as instructed and attached				✓			
3. Municipality was notified in advance of the start and closing date				✓			
4. The advertisement period complies with the required 30 days				✓			
5. If applicable, confirms that the site notice was placed and kept on site for the full duration of the public participation process				✓			
6. All communications (other than notices) in respect of the public participation process are attached				✓			
Proof of notices published							
7. If applicable, photo evidence to confirm site notice (one close up and one from across the street)				✓			
8. Wording of the advertisement accurate and copy attached				✓			
9. Proof of notices published (publication date visible)				✓			
Proof of notices served							
10. Wording of notice accurate and example attached				✓			
11. Proof of all notices served to neighbouring properties attached				✓			
12. Proof of all notices served to interest and community groups attached				✓			
13. Proof of all notices served to municipal departments and organs of state (government dept's and entities) attached				✓			
Comments received							
14. All objections and comments received attached, including amended comments if relevant				✓			
15. All comments from municipal departments and organs of state received (must also be attached to POE)				✓			
16. Consent from abutting property owners obtained and attached						✓	
17. Applicant's written reply / responding comments on all the objections attached				✓			

KINDLY NOTE:

1. The POE may only be submitted once all relevant municipal departments and organs of state have submitted their comment, inclusive of the applicant's written reply thereto.
2. When any comments have been discussed or amended terms negotiated with the relevant commenting entity, the amended comments and the applicant's written reply thereto must be attached to the POE.
3. The decision-making period will only commence after receipt and confirmation of a complete POE in accordance with section 57 of the Bylaw.

COMPLETE AND SIGN THE FOLLOWING DECLARATION**DECLARATION**

I, (full names & surname) Cornelis Rudolf Schröder

and ID No: 7805315089081, as the Applicant for the above application, hereby confirms:

- 1) the public participation process for the subject application was duly undertaken in accordance with the instruction for such process and the associated requirements stipulated in the Stellenbosch Municipal Land Use Planning Bylaw;
- 2) all comments and objections received are included in the Portfolio of Evidence;
- 3) the information contained in the above checklist and the accompanied information and documentation in the Portfolio of Evidence for the concluded public participation process, are accurate and complete; and
- 4) the personal information (e.g. name, address, contact details) of interested and affected parties as supplied by the Municipality was only used for official municipal communication matters with reference to the Protection of Personal Information Act 4 of 2013 (POPI).

Duly signed on 13 September 2024 at George
Date Place

**Rudolf
Schröder**

Digitally signed by Rudolf Schröder
 DN: cn=Rudolf Schröder,
 ou=Namaal,
 email=Rudolf.Schröder@zutari.com
 Date: 2024.09.13 08:31:43 +02'00'

Signature

For office use only

	NAME	SIGNATURE	DATE
VERIFIED BY ADMINISTRATIVE OFFICER			
CHECKED BY TOWN PLANNER			

NOTES TO BE RECORDED:



STELLENBOSCH MUNICIPALITY
STELLENBOSCH · PNIEL · FRANSCHHOEK

MEMORANDUM

DIREKTEUR: INFRASTRUKTUURDIENSTE
DIRECTORATE: INFRASTRUCTURE SERVICES

CIVIL ENGINEERING SERVICES

To ▫ Aan:	Director: Planning + Economic Development
Att Aandag:	Bulelwa Mdoda
From ▫ Van:	Manager: Development (Infrastructure Services)
Author ▫ Skrywer:	Tyrone King
Date ▫ Datum:	5 August 2024
Our Ref ▫ Ons Verw:	Civil LU 2644
Town Planning Ref:	LU/16572 – TP 591/2023
Re ▫ Insake:	Erf 7001, Stellenbosch: Rezoning and subdivision for 204 residential erven; relaxation of parking departure from 2 parking bays to 1 parking bay per dwelling house

The following engineering documents were evaluated as part of this application:

- Civil engineering services report by Zutari dated 2023/11/30 Rev 0
- TIA by Zutari dated 2024/06/11
- Subdivision layout Drawing No 1001918-240528 Rev 2 by Zutari dated 2024/05/28

Parking Departure: The parking departure is not supported. The Zutari motivation letter (undated) in response to our Memo dated 4 April 2024 states that the parking departure will only be required for the row housing erven, but not for semi-detached and free-standing erven. Row housing is not supported by the Infrastructure Directorate, specifically for stormwater drainage reasons, therefore the parking departure is also not supported.

In consideration of provisions related to Civil Engineering Services the application **(excluding the parking departure)** is supported subject to the following conditions:

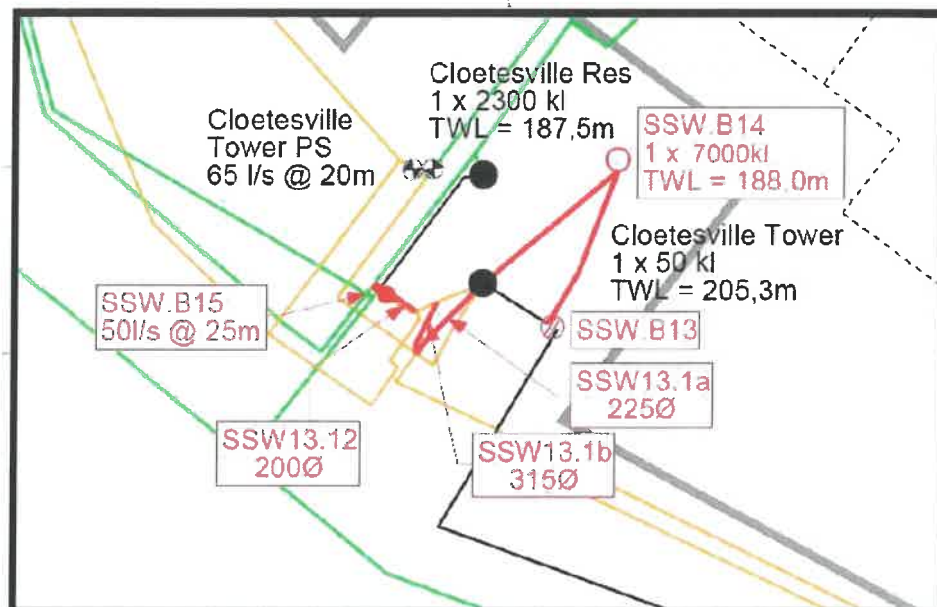
Specific Conditions: These conditions must be complied with prior to transfer of the first property or approval of any building plans, whichever occurs first.

1. Water

1.1 The following upgrades must be installed:

- 1.1.1 a) New 7.0ML Cloetesville Reservoir (SSW.B14);
 b) Upgrading of existing pumps from the reservoir to the Cloetesville water tower (SSW.B15);
 c) Upgrading of the existing pumps from the Idas Valley reservoir to Uniepark Reservoir which feeds the existing Cloetesville reservoir;

Funding: There is R22m ex VAT on the current budget (2024/25 – 2026/27) for “Bulk water supply pipe: Cloetesville / Idas Valley” that can be utilised to fund these items.

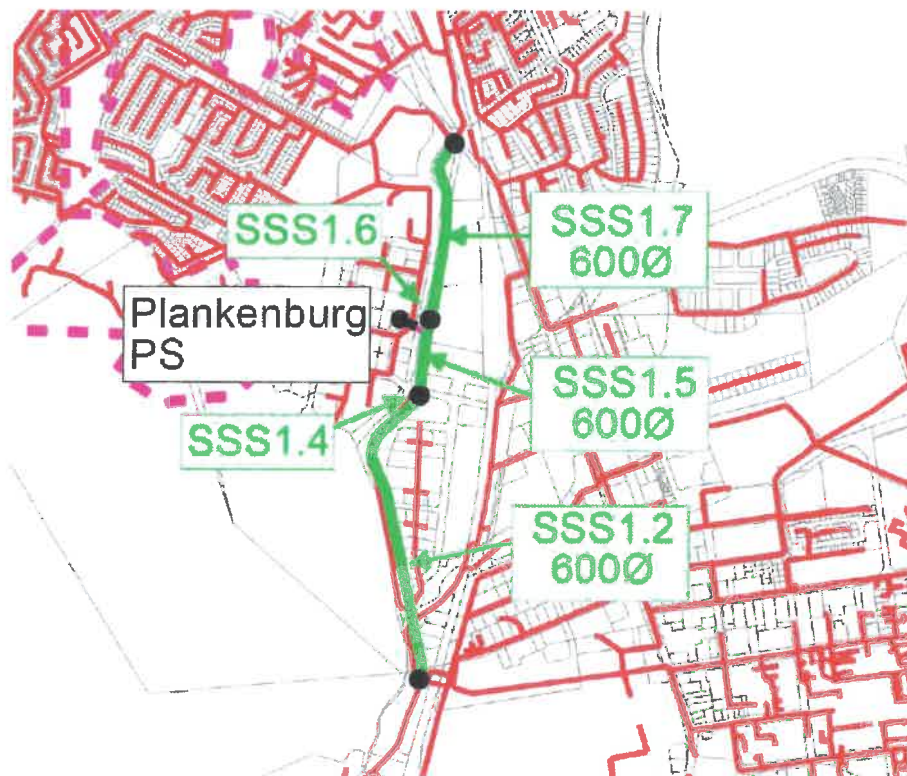


2. Sewer

2.1 The following upgrades must be installed:

2.1.1 Bulk sewer line form Kayamandi to Merriman Street (green line below).

Funding: Currently this project is not on the municipal budget. Budget should therefore be allocated to unlock this housing project.



3. Roads and NMT

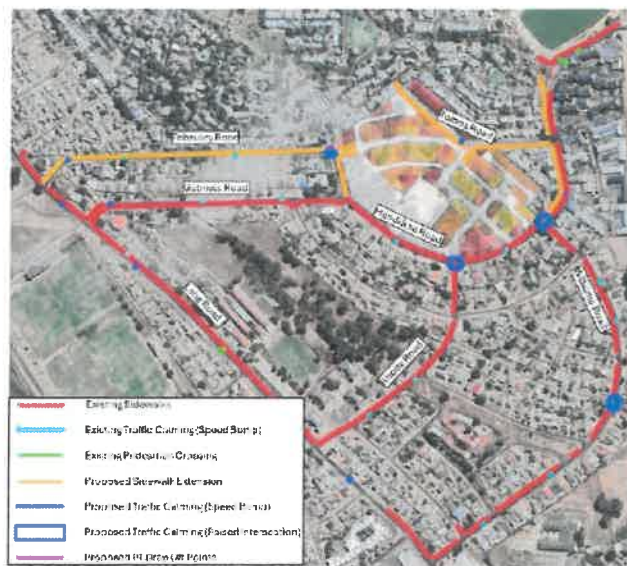
3.1 The following upgrades are must be installed as part of the housing project's implementation:

3.1.1 R44/Hendrickse intersection – provide an extended turning lane on Hendrickse Street (see image below).



Figure 18: Extension of short lane on Hendrikse Road.

- 3.1.2 Hendrickse Rd / Tolbos Rd and Lang St / Gabriel Rd must be converted into a STOP or Priority Control on only the minor approaches.
- 3.1.3 Expand the existing sidewalk along Hendrickse Rd and Gabriels Rd to link with Lang Street - which is the main route for public transport.
- 3.1.4 Install additional traffic calming measures (6x speedhumps and 4x raised intersections) along February Rd, Gabriels Rd, Tolbos Rd and Lang Rd (see **Roads locality and Traffic Calming plan** below).
- 3.1.5 Construct Public Transport Drop-off points – one along February Rd and one along Hendrickse Rd – exact positions to be confirmed during the detail design stage.



Roads locality and Traffic Calming plan

- 3.2 Any conditions stated by the Provincial Roads Engineer must be complied with.

4. Stormwater

- 4.1 The difference between the pre- and post-development run-off must be detained on-site - the two stormwater detention ponds as indicated on the subdivision plan must be completed, including inlet and outlet structures, erosion protection and connection to the existing stormwater networks.

5. Installation of Engineering Services

- 5.1 Over and above the bulk and external upgrades identified above, each newly created erf (or each building where subdivision is not applicable) must also be fully serviced to water- and sewer connections, stormwater drainage and roads/access points and all internal and link engineering services for the development must be installed by the developer and at his cost.
- 5.2 Detail engineering drawings must be submitted for approval prior to the commencement of construction.

6. As - Builts

- 6.1 Upon completion, a complete set of as-built drawings, as well as the asset verification information (in the case of municipal services) be submitted in a format acceptable to the Municipality. These drawings must be signed by a professionally registered engineer.

<u>General Conditions</u>

7. The provision and installation of the services for the development must comply with the Design Guidelines and Minimum Standards for Civil Engineering Services as published on the municipality's website and as amended from time-to-time.
8. The internal services are **public**. Therefore, all internal services will be maintained by the **Municipality**.
9. It is noted that the motivation report refers to "row-housing". Please note that for future planning and for the formulation of the SDP, row housing is not supported,

specifically due to stormwater drainage reasons, but semi-detached houses can be considered as an alternative to row-housing.

10. It is recommended that the following road infrastructure projects be prioritised the next time that the municipal budget is reviewed. These projects are required to address traffic congestion due to the background traffic in the catchment area of this development:

- a) Full dualling of the R44 between the R44/Hendrickse Street and R44/Fir Street intersection
- b) Signalisation of the R44 and Fir Street intersection
- c) Dualling of the R304 – Northbound and Southbound of the Welgevonden intersection



Tyrone King Pr Tech Eng
MANAGER: DEVELOPMENT (INFRASTRUCTURE SERVICES)

W:\2.0 DEVELOPMENT\01 Land Use applications\2644 (TK) Erf 7001 Stellenbosch (LU-16572 TP591-2023) Cloeteville Housing\2644 () Erf 7001 Stellenbosch (LU-16572 TP591-2023)_3 (approved).doc

**INTEROFFICE
MEMORANDUM**


STELLENBOSCH
STELLENBOSCH • PNIFL • FRANSCHHOEK
MUNICIPALITY • UMASIPALA • MUNISIPALITEIT

DEPARTMENT: COMMUNITY SERVICES

Stellenbosch Municipality, 123 Merriman Avenue, Stellenbosch, 7599

To:	Administrative Officer: Land Use Management Bulelwa Mdoda	From:	Senior Environmental Planner: Schalk van der Merwe
CC:		Date:	05 August 2024
Re:	APPLICATION FOR REZONING AND SUBDIVISION: ERF 7001, CLOETESVILLE (LU/16572)		

The above application refers. From an environmental planning point of view this department has no objection to the approval of the application on condition that:

1. Activities on site, during construction and thereafter, comply with the Western Cape Noise Control Regulations.
2. During construction the owner, developer or any agent acting on his/her behalf, must take all reasonable steps to prevent nuisance caused by dust in accordance with the National Dust Control Regulations.

S VD MERWE
SENIOR ENVIRONMENTAL PLANNER:
COMMUNITY SERVICES

**ELETRICITY SERVICES: CONDITIONS OF APPROVAL
ERF 7001 CLOETESVILLE**

GENERAL COMMENT:

1. Recommended for approval

CONDITIONS

2. The electrical consulting engineer responsible for the development shall schedule an appointment with Manager Electricity Services (Infrastructure Services) before commencing with the construction of the development. As well as to discuss new power requirements if required.

3. The development's specifications must be submitted to Stellenbosch Municipality (Infrastructure Services) for approval. i.e.

- a) The design of the electrical distribution system
- b) The location of substations(s) and related equipment.

4. A separate distribution board/s shall be provided for municipal switchgear and metering. (Shall be accessible & lockable).

5. 24-hour access to the location of the substation, metering panel and main distribution board is required by Electrical Services.

6. Appropriate caution shall be taken during construction, to prevent damage to existing service cables and electrical equipment in the vicinity, should damage occur, the applicant will be liable for the cost involved for repairing damages.

7. On completion of the development, Stellenbosch Municipality (Electrical Services) together with the electrical consulting engineer and electrical contractor will conduct a take-over inspection.

8.

9. All new developments and upgrades of supplies to existing projects are subject to **SANS 10400-XA** energy savings and efficiency implementations such as:

- Solar water Heating or Heat Pumps in building
- Energy efficient lighting systems
- Roof insulation with right R-value.
- In large building developments;
- Control Air condition equipment tied to alternative efficiency systems
- Preheat at least 50% of hot water with alternative energy saving sources
- All new hot water pipes to be clad with insulation with R-value of 1
- Provide a professional engineer's certificate to proof that energy saving measures is not feasible.

10. If connecting a generator or solar panels for backup, the generator or solar panels needs to comply to SANS10142



Signature

26/02/2024

Date

APPENDIX E:
Comments from Heritage Western Cape

7001
Cloeteville



iLifa leMveli iNtshona leSizwe

Erfenis Muskeke

Heritage Western Cape

REGISTERED POST

Our Ref: HM/ CAPE WINELANDS / STELLENBOSCH / ERF 7001
Case No.: 19011611SB0118E
Enquiries: Stephanie-Anne Barnardt
E-mail: stephanie.barnardt@westerncape.gov.za
Tel: 021 483 9689
Date: 31 January 2019

Guillaume Nel
 45 Fabriek Street
 Paarl
 7646
gn@gnec.co.za , carina@gnec.co.za

RESPONSE TO NOTIFICATION OF INTENT TO DEVELOP: FINAL
In terms of Section 38(8) of the National Heritage Resources Act (Act 25 of 1999) and the Western Cape
Provincial Gazette 6061, Notice 298 of 2003

NOTIFICATION OF INTENT TO DEVELOP: PROPOSED RESIDENTIAL DEVELOPMENT ON ERF 7001, CLOETESVILLE, STELLENBOSCH, SUBMITTED IN TERMS OF SECTION 38(8) OF THE NATIONAL HERITAGE RESOURCES ACT (ACT 25 OF 1999)

CASE NUMBER: 19011611SB0118E

The matter above has reference.

Heritage Western Cape is in receipt of your application for the above matter received on 18 January 2019. This matter was discussed at the Heritage Officers meeting held on 28 January 2019.

You are hereby notified that, since there is no reason to believe that the proposed residential development, will **not impact** on heritage resources, no further action under Section 38 of the National Heritage Resources Act (Act 25 of 1999) is required.

However, should any heritage resources, including evidence of graves and human burials, archaeological material and paleontological material be discovered during the execution of the activities above, all works must be stopped immediately and Heritage Western Cape must be notified without delay.

This letter does not exonerate the applicant from obtaining any necessary approval from any other applicable statutory authority.

HWC reserves the right to request additional information as required.

Should you have any further queries, please contact the official above and quote the case number.

Yours faithfully

Dr. Mxolisi Dlamuka
 Chief Executive Officer, Heritage Western Cape

www.westerncape.gov.za/cas

Street Address: P.O. Box 1200, Cape Town, 8001 • Postal Address: P.O. Box 1200, Cape Town, 8001
 • Tel: +27 (0)21 483 9689 • E-mail: her@westerncape.gov.za
 Straatadres: P.O. Box 1200, Kaapstad, 8001 • Posadres: P.O. Box 1200, Kaapstad, 8001
 • Tel: +27 (0)21 483 9689 • E-pos: her@westerncape.gov.za

APPENDIX F:
Comments from Infrastructure Services



STELLENBOSCH MUNICIPALITY
STELLENBOSCH · PNIEL · FRANSCHHOEK

MEMORANDUM

DIREKTEUR: INFRASTRUKTUURDIENSTE
DIRECTORATE: INFRASTRUCTURE SERVICES

CIVIL ENGINEERING SERVICES

To ▫ Aan:	Director: Planning + Economic Development
Att Aandag:	Bulelwa Mdoda
From ▫ Van:	Manager: Development (Infrastructure Services)
Author ▫ Skrywer:	Tyrone King
Date ▫ Datum:	5 August 2024
Our Ref ▫ Ons Verw:	Civil LU 2644
Town Planning Ref:	LU/16572 – TP 591/2023
Re ▫ Insake:	Erf 7001, Stellenbosch: Rezoning and subdivision for 204 residential erven; relaxation of parking departure from 2 parking bays to 1 parking bay per dwelling house

The following engineering documents were evaluated as part of this application:

- Civil engineering services report by Zutari dated 2023/11/30 Rev 0
- TIA by Zutari dated 2024/06/11
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Parking Departure: The parking departure is not supported. The Zutari motivation letter (undated) in response to our Memo dated 4 April 2024 states that the parking departure will only be required for the row housing erven, but not for semi-detached and free-standing erven. Row housing is not supported by the Infrastructure Directorate, specifically for stormwater drainage reasons, therefore the parking departure is also not supported.

In consideration of provisions related to Civil Engineering Services the application (excluding the parking departure) is supported subject to the following conditions:

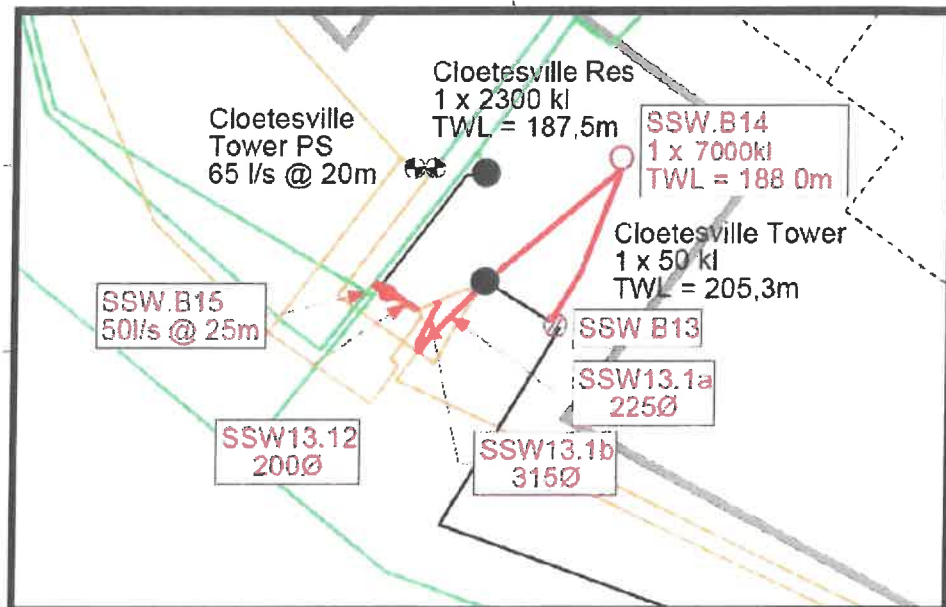
Specific Conditions: These conditions must be complied with prior to transfer of the first property or approval of any building plans, whichever occurs first.

1. Water

1.1 The following upgrades must be installed:

- 1.1.1 a) New 7.0ML Cloetesville Reservoir (SSW.B14);
 b) Upgrading of existing pumps from the reservoir to the Cloetesville water tower (SSW.B15);
 c) Upgrading of the existing pumps from the Idas Valley reservoir to Uniepark Reservoir which feeds the existing Cloetesville reservoir;

Funding: There is R22m ex VAT on the current budget (2024/25 – 2026/27) for “Bulk water supply pipe: Cloetesville / Idas Valley” that can be utilised to fund these items.

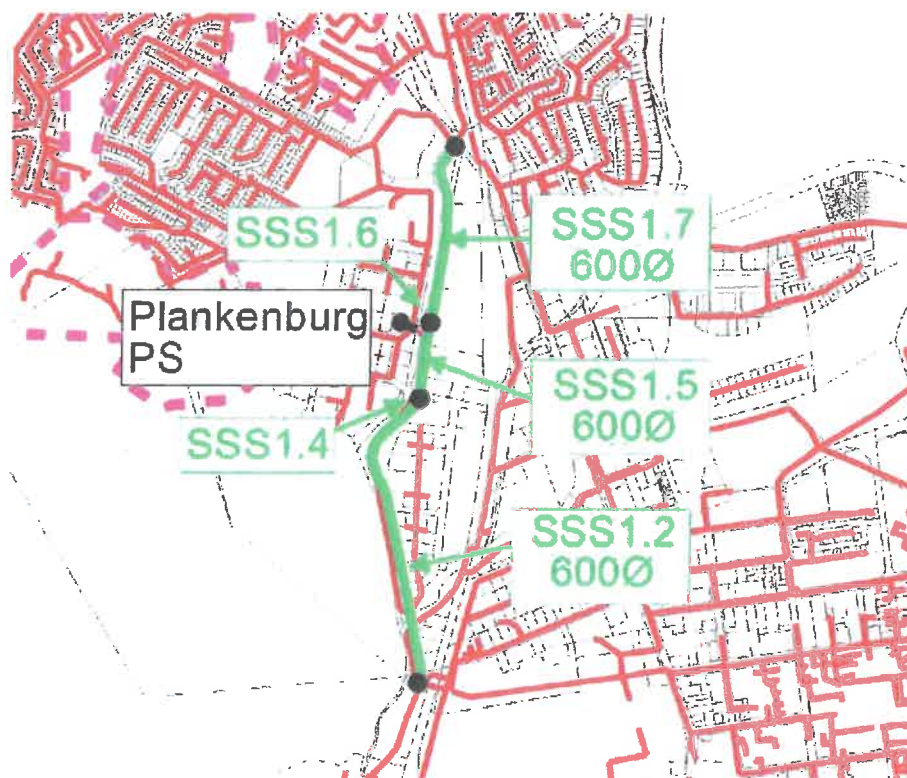


2. Sewer

2.1 The following upgrades must be installed:

2.1.1 Bulk sewer line form Kayamandi to Merriman Street (green line below).

Funding: Currently this project is not on the municipal budget. Budget should therefore be allocated to unlock this housing project.



3. Roads and NMT

3.1 The following upgrades are must be installed as part of the housing project's implementation:

3.1.1 R44/Hendrickse intersection – provide an extended turning lane on Hendrickse Street (see image below).

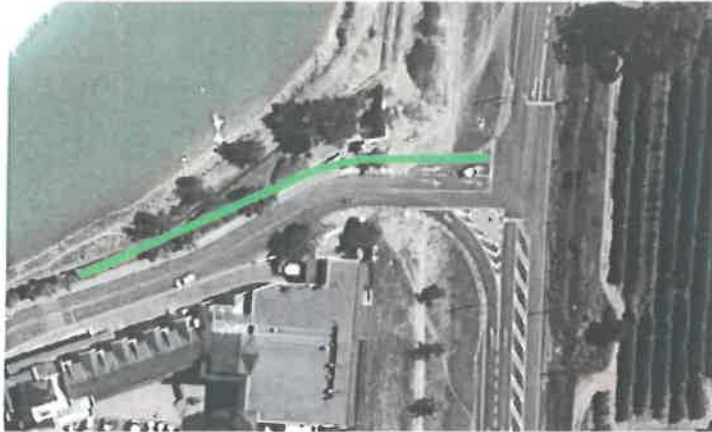
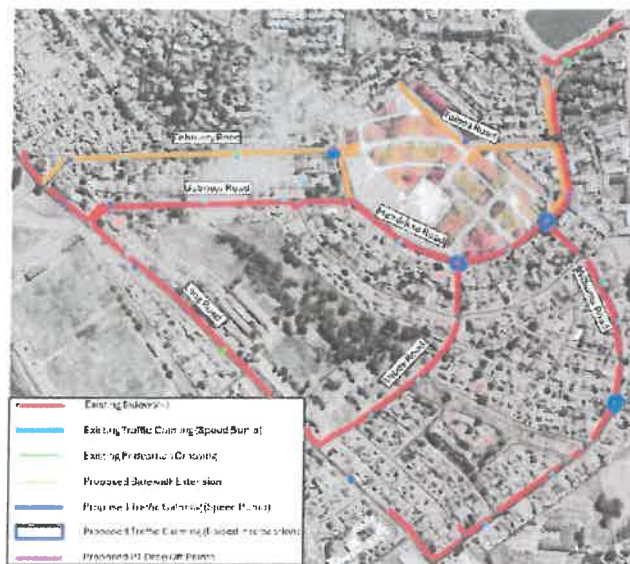


Figure 18: Extension of short lane on Hendrickse Road.

- 3.1.2 Hendrickse Rd / Tolbos Rd and Lang St / Gabriel Rd must be converted into a STOP or Priority Control on only the minor approaches.
- 3.1.3 Expand the existing sidewalk along Hendrickse Rd and Gabriels Rd to link with Lang Street - which is the main route for public transport.
- 3.1.4 Install additional traffic calming measures (6x speedhumps and 4x raised intersections) along February Rd, Gabriels Rd, Tolbos Rd and Lang Rd (see **Roads locality and Traffic Calming plan** below).
- 3.1.5 Construct Public Transport Drop-off points – one along February Rd and one along Hendrickse Rd – exact positions to be confirmed during the detail design stage.



Roads locality and Traffic Calming plan

- 3.2 Any conditions stated by the Provincial Roads Engineer must be complied with.

4. Stormwater

- 4.1 The difference between the pre- and post-development run-off must be detained on-site - the two stormwater detention ponds as indicated on the subdivision plan must be completed, including inlet and outlet structures, erosion protection and connection to the existing stormwater networks.

5. Installation of Engineering Services

- 5.1 Over and above the bulk and external upgrades identified above, each newly created erf (or each building where subdivision is not applicable) must also be fully serviced to water- and sewer connections, stormwater drainage and roads/access points and all internal and link engineering services for the development must be installed by the developer and at his cost.
- 5.2 Detail engineering drawings must be submitted for approval prior to the commencement of construction.

6. As - Builts

- 6.1 Upon completion, a complete set of as-built drawings, as well as the asset verification information (in the case of municipal services) be submitted in a format acceptable to the Municipality. These drawings must be signed by a professionally registered engineer.

<u>General Conditions</u>

7. The provision and installation of the services for the development must comply with the Design Guidelines and Minimum Standards for Civil Engineering Services as published on the municipality's website and as amended from time-to-time.
8. The internal services are **public**. Therefore, all internal services will be maintained by the **Municipality**.
9. It is noted that the motivation report refers to "row-housing". Please note that for future planning and for the formulation of the SDP, row housing is not supported,

specifically due to stormwater drainage reasons, but semi-detached houses can be considered as an alternative to row-housing.

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- b) Signalisation of the R44 and Fir Street intersection
- c) Dualling of the R304 – Northbound and Southbound of the Welgevonden intersection



Tyrone King Pr Tech Eng
MANAGER: DEVELOPMENT (INFRASTRUCTURE SERVICES)

W:\2.0 DEVELOPMENT\01 Land Use applications\2644 (TK) Erf 7001 Stellenbosch (LU-16572 TP591-2023) Cloeteville Housing\2644 () Erf 7001 Stellenbosch (LU-16572 TP591-2023)_3 (approved).doc

APPENDIX G:
Comments from Electrical Engineering

**ELETRICITY SERVICES: CONDITIONS OF APPROVAL
ERF 7001 CLOETESVILLE**

GENERAL COMMENT:

- 1. Recommended for approval**

CONDITIONS

2. The electrical consulting engineer responsible for the development shall schedule an appointment with Manager Electricity Services (Infrastructure Services) before commencing with the construction of the development. As well as to discuss new power requirements if required.

3. The development's specifications must be submitted to Stellenbosch Municipality (Infrastructure Services) for approval. i.e.

- a) The design of the electrical distribution system
- b) The location of substations(s) and related equipment.

4. A separate distribution board/s shall be provided for municipal switchgear and metering. (Shall be accessible & lockable).

5. 24-hour access to the location of the substation, metering panel and main distribution board is required by Electrical Services.

6. Appropriate caution shall be taken during construction, to prevent damage to existing service cables and electrical equipment in the vicinity, should damage occur, the applicant will be liable for the cost involved for repairing damages.

7. On completion of the development, Stellenbosch Municipality (Electrical Services) together with the electrical consulting engineer and electrical contractor will conduct a take-over inspection.

8.

9. All new developments and upgrades of supplies to existing projects are subject to **SANS 10400-XA** energy savings and efficiency implementations such as:

- Solar water Heating or Heat Pumps in building
- Energy efficient lighting systems
- Roof insulation with right R-value.
- In large building developments;
- Control Air condition equipment tied to alternative efficiency systems
- Preheat at least 50% of hot water with alternative energy saving sources
- All new hot water pipes to be clad with insulation with R-value of 1
- Provide a professional engineer's certificate to proof that energy saving measures is not feasible.

10. If connecting a generator or solar panels for backup, the generator or solar panels needs to comply to SANS10142



Signature

26/02/2024

Date

APPENDIX H:
Comments from Community Services

INTEROFFICE MEMORANDUM



STELLENBOSCH
STELLENBOSCH • PNIFL • FRANSCHHOEK
MUNICIPALITY • UMASIPALA • MUNISIPALITEIT

DEPARTMENT: COMMUNITY SERVICES

Stellenbosch Municipality, 123 Merriman Avenue, Stellenbosch, 7599

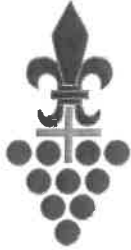
To:	Administrative Officer: Land Use Management Bulelwa Mdoda	From:	Senior Environmental Planner: Schalk van der Merwe
CC:		Date:	05 August 2024
Re:	APPLICATION FOR REZONING AND SUBDIVISION: ERF 7001, CLOETESVILLE (LU/16572)		

The above application refers. From an environmental planning point of view this department has no objection to the approval of the application on condition that:

1. Activities on site, during construction and thereafter, comply with the Western Cape Noise Control Regulations.
2. During construction the owner, developer or any agent acting on his/her behalf, must take all reasonable steps to prevent nuisance caused by dust in accordance with the National Dust Control Regulations.

S VD MERWE
SENIOR ENVIRONMENTAL PLANNER:
COMMUNITY SERVICES

APPENDIX I:
Comments from Spatial Planning



STELLENBOSCH

STELLENBOSCH • PNIEL • FRANSCHHOEK

MUNICIPALITY • UMASIPALA • MUNISIPALITEIT

Spatial Planning

To : Manager: Land Use Management
 From : Manager: Spatial Planning
 Reference : Erf 7001, Stellenbosch
 LU No : LU/16572
 Date : 17 May 2024
 Re : Application for rezoning, departure, subdivision, closure of public open space and consent use on Erf 7001, Hendrickse Street (Cloetesville), Stellenbosch

FILE NR:	E 7001 S
SCAN NR:	
COLLABORATOR NR:	767876

I refer to your request for comment on the above application.

Application is made for the following:

- **Rezoning** of Erf 7001 Stellenbosch from "Public Open Space Zone" to a "Subdivisional area" in order to allow for the following uses:
 - 201 Conventional Residential Zone Erven
 - 5 Public Open Space Zone Erven
 - 1 Utility Services Zone Erf and
 - 1 Public Road and Parking Zone
- **Permanent departure;**
 - to relax the parking requirements from 2 parking bays to 1 parking bay per dwelling house.
 - To relax the Street building line from 2m (Up to 250m²) and 3m (251m² to 500m²) to 1m and the common building lines from 1m to 0m for all residential zoned properties.
- **Subdivision** of Erf 7001 into 208 erven, namely;
 - Erf 1 to Erf 201 (Conventional Residential Zone Erven) ranging from ±120m² to ±300m² (total of 3.3ha).
 - Erf 202 (±945m²), Erf 203 (±548m²), Erf 204 (±261m²), Erf 205 (±5866m²) and Erf 206 (±8.4m²) zoned Public Open Space Zone;
 - Erf 207 (±6477m²) zoned Utility Services Zone.
 - Erf 208 (±17921m²) zoned Public Road and Parking Zone.
- **Closure of a part of a public space** (Erf 7001, Stellenbosch).
- **Consent use** to erect a telecommunications mast on the portion to be zoned as Public Open Space Zone (Erf 205).

STELLENBOSCH MUNICIPALITY
 PLANNING AND DEVELOPMENT SERVICES

31 MAY 2024

RECEIVED

1) Opinion/reasoning:

The amended Municipal Spatial Development Framework for the WC024 area was approved by Council in June 2023 and recognises that the spatial decisions and actions of many make what settlements are.

In terms of this approved document, seven principles need to be considered:

1. Maintain and grow the assets of Stellenbosch Municipality's natural environment and farming areas;
2. Respect and grow cultural heritage;
3. Direct growth to areas of lesser natural and cultural significance as well as movement opportunity;
4. Clarify and respect the different roles and potentials of existing settlements;
5. Clarify and respect the roles and functions of different elements of movement structure;
6. Ensure balanced, sustainable communities;
7. Focus collective energy on a few catalytic lead projects.

With the enactment of the Spatial Planning and Land Use Management Act 16 of 2013 (SPLUMA), a new planning regime was introduced in South Africa. It replaced disparate apartheid era laws with a coherent legislative system as the foundation for all spatial planning and land use management activities in South Africa. It seeks to promote consistency and uniformity in procedures and decision-making. Other objectives include addressing historical spatial imbalances and the integration of the principles of sustainable development into land use and planning regulatory tools and legislative instruments.

Chapter 2 of SPLUMA sets out the development principles that must guide the preparation, adoption and implementation of any SDF, policy or by-law concerning spatial planning and the development or use of land. These principles are the following:

- Spatial Justice
- Spatial Efficiency
- Spatial Sustainability
- Spatial Resilience
- Good Administration

The site of development has a gentle sloping topography that is ideal for the proposed housing development. The site is currently vacant with some municipal infrastructure (water reservoir) and a large number of trees that are present on the site.

The project aims to facilitate a sustainable integrated development including medium to upper income housing units (GAP) that will address the housing needs in Cloetesville and ensure social and economic sustainability of the inhabitants of Cloetesville and beneficiaries as defined by the Stellenbosch Municipality.

The particular goal of this housing development is the delivery of medium to upper (GAP) housing units. A variety of housing typologies and erf configurations have been considered to support flexibility in relation to market/income groups, financing options, density and mix of typologies.

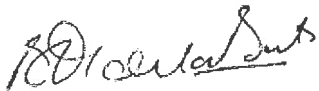
The subject property is located inside the urban edge of Stellenbosch town within a residential area known as Cloetesville. The area is earmarked to be developed for "Mixed-Use Community and Residential Infill. In terms of the approved MSDF densification and infill are encouraged.

2) Supported / not supported:

This department supports the application as the subject property falls within an area where a mixed-use community and residential infill development is promoted.

However, we do recommend that an Urban Design/Landscape Plan be submitted to the Municipality and that new trees be replanted to form part of the new development.

This department reserves the right to revise initial comments and request further information based on any new or revised information received.



BJG de la Bat
MANAGER: SPATIAL PLANNING