



CIVIL CONCEPTS

Consulting Civil and Structural Engineers

**PORTION 426 & 679 OF THE FARM
DERDEPOORT 326-JR
(DERDEPOORTPARK X44)**

**ROADS AND STORMWATER BULK
SERVICES REPORT**

**C3034/DPX44/R&SW/REP – REV 1
DECEMBER 2022**



CIVILS

Table of Contents

1	GENERAL INFORMATION.....	1
1.1	Application Number	1
1.2	Location of the Area Concerned	1
1.3	Property Owner / Developer Information	2
1.4	Consulting Engineers.....	2
1.5	Development Information.....	2
2	DESIGN STANDARDS	2
2.1	Road Design Standards.....	2
2.2	Stormwater Design Standards.....	4
2.3	General Standards.....	4
3	ROADS IMPACT ASSESSMENT AND PROPOSED INFRASTRUCTURE.....	4
3.1	Existing road network - according to the City of Tshwane's 2015 Road Masterplan prepared by Tolplan.....	4
3.2	Planned Future Road Network	5
3.3	Access	7
3.4	Roads Trip Generation	7
3.5	Recommended Road Upgrades by the Developer	8
3.6	Upgrades by SANRAL	8
3.7	Internal Road Network	10
4	STORMWATER IMPACT ASSESSMENT AND PROPOSED INFRASTRUCTURE	11
4.1	Description of Existing Stormwater.....	11
4.2	Stormwater Runoff.....	11
4.3	Details of Proposed New and Upgrades to Stormwater Infrastructure	11
5	COST ESTIMATES.....	12
5.1	Cost Schedules for upgrades required	12
5.2	Estimate of Development Charges	13
5.3	Summary of Cost.....	14
6	COST ESTIMATES.....	14
6.1	Total Project Construction Value (Municipal Services)	14
6.2	Total Project Construction Value (Provincial)	14
6.3	Construction Period and Intended Construction Start Date	14
6.4	Relevant Environmental Authorisations and WULA Requirements.....	14
6.5	Wayleaves to be obtained from City of Tshwane, Gautrans and SANRAL.....	14
6.6	Servitudes.....	14

1 GENERAL INFORMATION

1.1 Application Number

The township application for the proposed Derdepoortpark Ext. 44 on Portion 426 & 679 of the Farm Derdepoort 326-JR was submitted by The Town Planning Hub the reference number will be provided once received.

Application Number: TBC

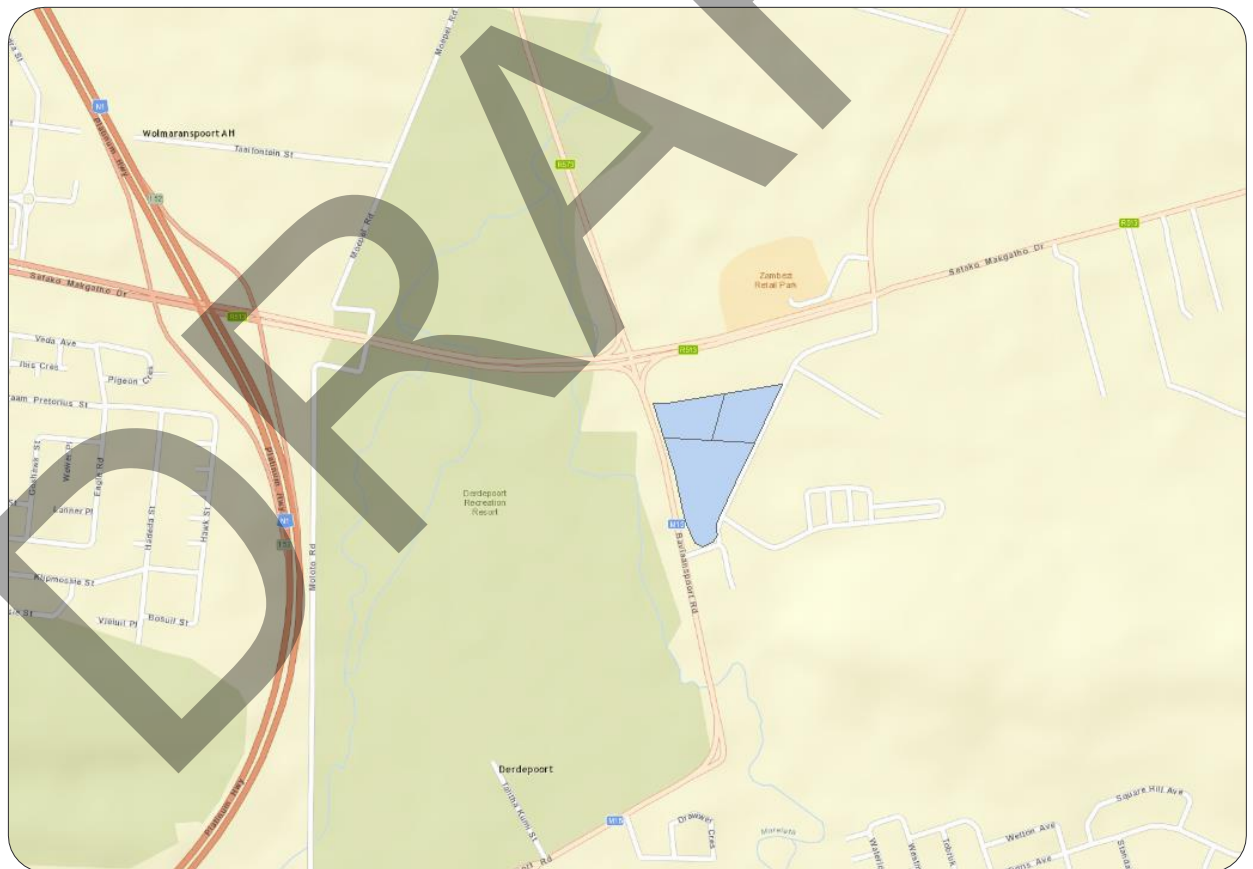
1.2 Location of the Area Concerned

The development to be known as Derdepoortpark Ext. 44 is situated on Portion 426 & 679 of the Farm Derdepoort 326-JR.

It is bounded by:

- Portion 20 of the Farm Derdepoort 326-JR to the North;
- Intaba Road to the East and South; and
- Baviaanspoort Street to the West.

The development is highlighted on the image below:



1-1: Locality

1.3 Property Owner / Developer Information

Zotec Development (Pty) Ltd
 Reg No: 2003/023822/07
 P.O Box 754
 Auckland Park
 2006

Physical Address:
 Castle Gate Offices
 478 Koedoesnek Avenue
 Waterkloof
 0181

Tel: 012 548 4114
 Mail: leon@centraldev.co.za

Responsible person: Mr. Leon Botha

Refer to **Annexure A** for Title Deed.

1.4 Consulting Engineers

Civil Concepts (Pty) Ltd
 Reg. No: 95/12428/07
 P O Box 36148
 Menlo Park
 0102

Physical Address:
 50, 15th Street
 Menlo Park
 0081

Tel: 012 460 0008
 Fax: 012 460 0005
 Mail: werner@civilconcepts.co.za

The responsible person is: Mr W Stander (Reg no 20060017).

1.5 Development Information

The property is currently zoned Agricultural. A township establishment application for Derdepoortpark X44 situated on Portion 426 & 679 of the Farm Derdepoort 326-JR was submitted by Town Planning Hub for the rights in the table below. Refer to **Annexure B** for Conditions of Establishment.

Erf Numbers	Land Use	Area	Density	No of Units
426	Res 4 – Dwelling Units	3.7410	120 units / ha	449
679	Res 4 – Dwelling Units	4.194	120 units / ha	503
Total		7.935		952

2 DESIGN STANDARDS

2.1 Road Design Standards

Note that although the roads internal to the township will only be handed over to the HOA, or non-profit company, the roads will be constructed to City of Tshwane standards.

The following sub-clauses summarise the applied design standards on all classes of road. The unit rates are based on these standards.

2.1.1 Radii at Intersections

The Radii at intersections are as follows:

- Class 3 – 15 m
- Class 4a - 12 m
- Class 4b - 10 m
- Other - 10 m

2.1.2 Kerbing

At Class 2, 3, 4 and 5 intersections, Fig 7 kerbing with 150 mm in situ concrete channel will be used.

Mountable kerbs will be 500 mm wide on the Class 4b road where applicable, 400 mm wide on the 5.5m wide Class 5 roads, and 300 mm wide on 5.0 m wide roads.

2.1.3 Pavement Design

The pavement design will be based on the following road categories and traffic classes as per the TRH4 guideline.

Road Classification	Class	Reserve	Category	Traffic Class
Local Distributor	3	25 m	B	ES3
Urban Collectors	4	20 m	B	ES2
Local Streets	5	13 & 16 m	B	ES2

2.1.4 In Situ Conditions

All in situ conditions will be confirmed by means of a geotechnical investigation and laboratory testing before commencement of detail design of the pavement structure.

2.1.5 Proposed Treatment of Poor In-Situ Conditions

Where CBR values of in situ material are below 3, a blended roadbed or rockfill material will be used. This can only be determined once the boxcut is open.

2.1.6 Layer works Design

Road Class Traffic Class	Layer Depth (mm)	Layer Description
Class 4 Category B ES3	30 mm	Continuously medium graded asphalt (AC)
	150 mm	Crushed stone base to 88% apparent density (G1)
	150 mm	Stabilised sub base to 95% MDD, (C4) min UCS = 1000 kPa @ 100% of MDD
	150 mm	Upper selected layer to 93% of MDD (G7) if in-situ CBR ≤ 15
	150 mm	Lower selected layer to 93% of MDD (G7) if in-situ CBR ≤ 7
Class 5 Category B ES0.3	150 mm	In-situ roadbed to 90% of MDD
	30 mm	Continuously medium graded asphalt (AC)
	125 mm	Crushed stone base to 88% apparent density (G1)
	125 mm	Stabilised sub base to 95% MDD, (C4) min UCS = 1000 kPa @ 100% of MDD
	150 mm	Upper selected layer to 93% of MDD (G7) if in-situ CBR ≤ 15
	150 mm	Lower selected layer to 93% of MDD (G7) if in-situ CBR ≤ 7
	150 mm	In-situ roadbed to 90% of MDD

2.1.7 Geometric Design Standards

2.1.8 Design Speed

All geometric standards are based on 80km/h for Class 2 Roads, and 60 km/h design speed for Class 3 to Class 5 roads.

2.1.9 Horizontal & Vertical Alignment, Intersections

Geometric designs of the road upgrades will be in accordance with the applicable standards of the City of Tshwane and any other relevant authority.

2.2 Stormwater Design Standards

For internal networks, the following design principles of the City of Tshwane were incorporated to determine the element sizes:

- All major and minor systems within road reserves must be a closed system in the form of pipe or box culverts;
- The major systems are a combination of street capacity and underground systems;
- A maximum flow depth of 100 mm may be used for calculating street capacity;
- All townships must have an underground pipe connection to a municipal stormwater network;
- The design flow is determined with the difference between the 1: 20 year runoff and the road capacity;
- A minimum 1: 2 year runoff connection must be provided for any township development;
- If no road capacity is available, i.e. midblock or Class 4(a) and higher roads, a 1: 20 year runoff connection must be provided;
- The minimum pipe diameter in road reserves is 450 mm ϕ .

The design of the network is based on the following steps:

2.2.1 Major Networks - 20 Year Runoff

- Selection of appropriate design standards;
- Determination of the major catchment for the area;
- Determination of an anticipated stormwater drainage network and physical properties i.e. length and slope; and
- Determination of the required types and sizes of the drainage network elements through hydrological modelling using the Rational Method or Autodesk Storm and Sanitary Analysis.

Major networks are required to accommodate the 1:20 year runoff. The pipe or box culvert size was determined according to the total flow less the flow in the road.

2.2.2 Minor Networks - 2 Year Runoff

- Determine minor sub-catchments drainage to the minor networks;
- Determine physical characteristics of minor catchments and networks; and
- Determination of the required types and sizes with the Rational Method and first principles.

2.3 General Standards

All work to be handed over to City of Tshwane will be constructed to the minimum standard of SANS1200, with amendments to the specification in order to comply with “*Standard Specification for Municipal Civil Engineering Works (CoT, 2005)*”, as well as in accordance with the “*Standard construction details and design standards for roads and stormwater drainage infrastructure (latest edition)*”.

3 TRAFFIC IMPACT ASSESSMENT

A TIA has been compiled for this development by Messrs Dhubecon and was submitted for approval. The Front Page is included in **Annexure C**.

4 ROADS IMPACT ASSESSMENT AND PROPOSED INFRASTRUCTURE

4.1 Existing road network - according to the City of Tshwane’s 2015 Road Masterplan prepared by Tolplan.

The following major roads are in close proximity to the development and will provide access to the township:

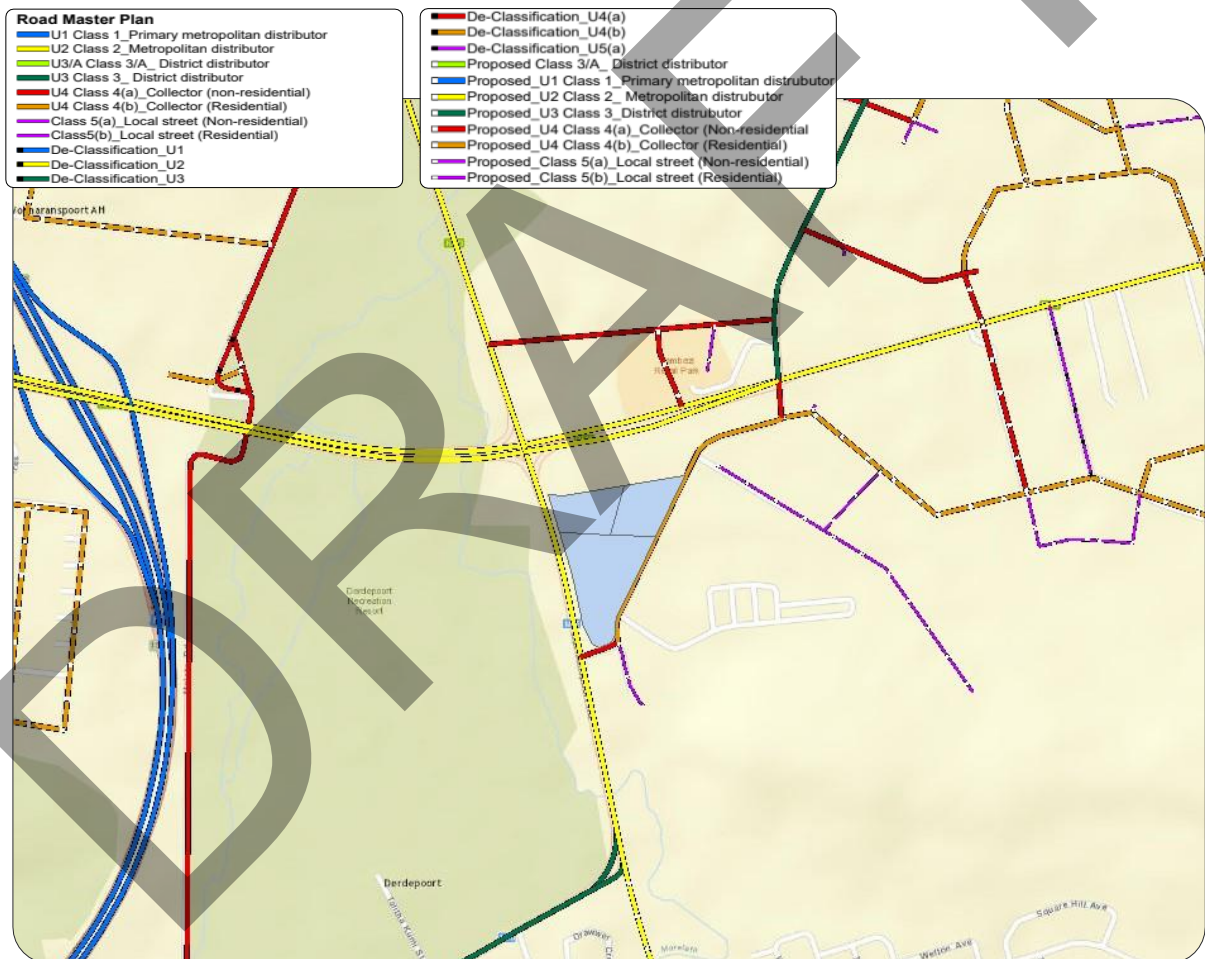
Sefako Makgatho Drive (R513 / K14): is classified as a Class 2 east-west major arterial road, which is situated about 120m to the north of the site. The road comprises of a 4-lane dual carriageway road (two lanes per direction) with additional turning lanes provided at its intersection with Baviaanspoort Road (M15 / D1386). Furthermore, most of the main intersection along this road are signalised. It is

anticipated that most of the development’s estimated traffic would travel via this road given its close proximity to the site as well as the fact that this is the most convenient road for vehicles to use to get to the N1 freeway, which is situated about 1.5km west of the site.

Baviaanspoort Road (M15 / Future K139): is a Class 2 north-south major arterial road, which runs along the western boundary of the site. The road comprises of a 2-lane single carriageway (one lane per direction, undivided) with additional turning lanes provided at its priority stop T-intersection with Intaba Street. It is also to note that north of its full signalized intersection.

Intaba Street: is classified as a Class 4b collector road which runs along the south-eastern boundary of the site. From this road, a single security-controlled access in the form of a priority stop controlled butterfly T-intersection is proposed.

N1 Freeway: is classified as a Class 1 freeway which is located about 1.5km to the west of the site. It is considered important to the site as it would provide regional accessibility via the intersection with Sefako Makgatho Drive and it is expected that a large amount of the development’s traffic would distribute towards this freeway in particular.



4-1: CoT Road Masterplan of the Vicinity

4.2 Planned Future Road Network

In terms of the local municipal road network, there are no planned roads in the study area that will be affected by the proposed development. However, it is important to note that Intaba Street is currently in a sub-standard condition and as part of the SANRAL road upgrades, this road would actually be rehabilitated and formalized up to the required road standards.

The portion of this road that travels past the south-eastern boundary of the township (approximately 480m in length) would become the responsibility of the developer to rehabilitate, should the development of the subject township occur before the SANRAL upgrades are carried out. The implementation and responsibility of these road upgrades are therefore highly dependent on the timeline of the implementation of the subject township and the SANRAL road upgrades planned in the

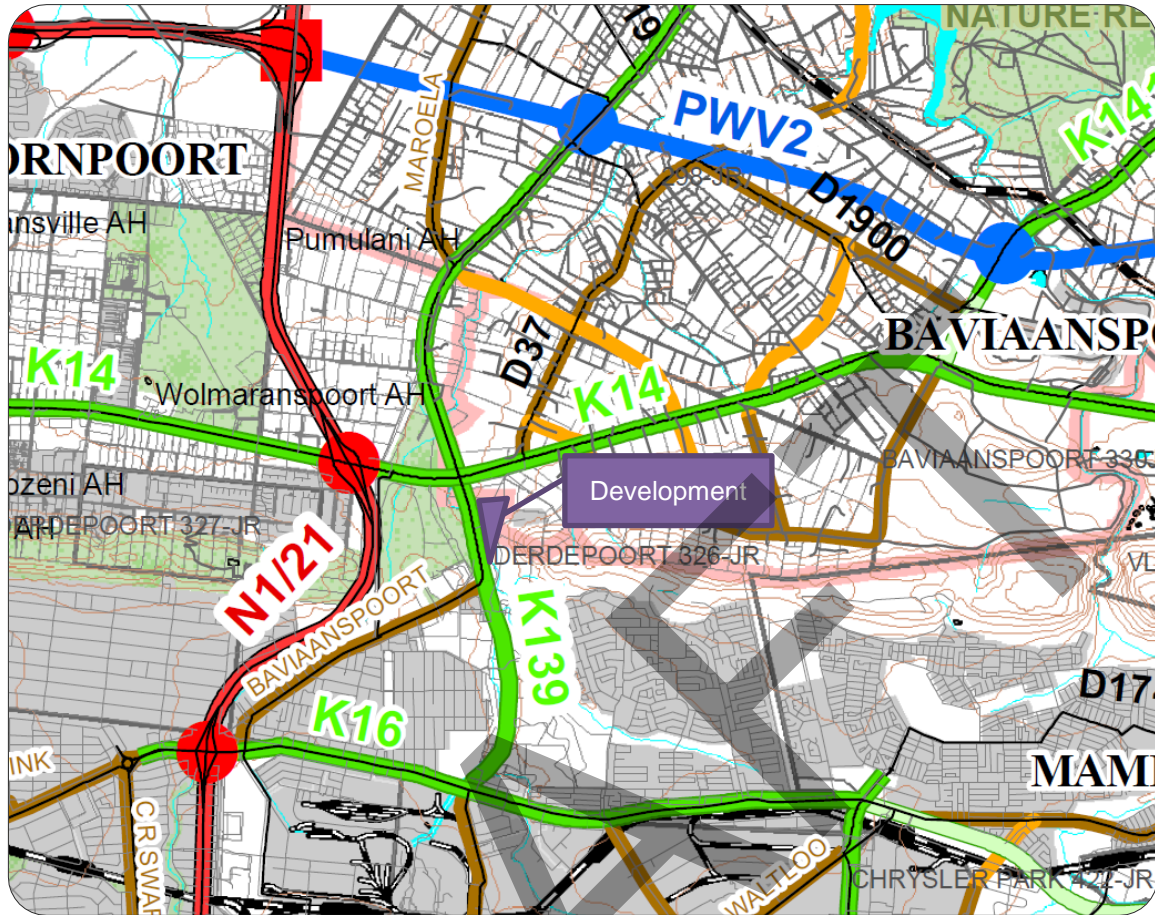
area.

The following information is relevant for the other road upgrades that will be implemented by SANRAL:

- SANRAL will construct the future K139 provincial road that travels past the western boundary of the site. This upgrade comprises the upgrading of Baviaanspoort Road (M15) to a dual carriageway road separated by a median island that has three lanes traveling in each direction. It is also to note that that the Baviaanspoort / Moloto Road will form a grade separated interchange with Sefako Makgatho Drive near the north-western corner of the site. Given the extent of this planned upgrade, this specific intersection was not included as part of the analysed key intersections of the report as any upgrade proposed for this intersection would be redundant given that the capacity which would be provided by this planned new interchange would supersede any minor upgrade that is proposed to the existing intersection for the developer.
- With regards to Intaba Street, apart from the rehabilitation of the road as discussed above, this road is also set to be extended in a southbound direction from the south-eastern corner of the site. Approximately 600m south of the site's south-eastern corner, this road's alignment is set to curve in a western direction until it eventually intersects with Baviaanspoort Road (M15). At this planned new intersection, the intention is also to construct a whole new southern leg which will also intersect with Stormvoël Road (M8) further to the south. This southern leg also forms part of the planned alignment of the K139 road. The northern and southern approaches of this intersection is viewed as the K139 while the western and eastern approaches are respectively viewed as Baviaanspoort Road and Intaba Street for the purposes of this report.
- It is important to note that there is an existing priority stop controlled T-intersection between Intaba Street and the existing Baviaanspoort Road (M15) near the south-western corner of the property. This intersection would, however, be closed off in the future and the traffic through this intersection would redistribute towards the newly planned intersection between the K139, Intaba Street and Baviaanspoort Road (M15) further to the south instead. The main reason behind the closure of the T-intersection is due to the sub-standard spacing between this intersection and the planned grade-separated interchange between Baviaanspoort Road (M15) / Moloto Road (R573) and Sefako Makgatho Drive (R513) as well as the newly planned intersection further south.
- At the existing signalized intersection between Sefako Makgatho Drive (R513) & Intaba Street to the north-east of the site, additional through lanes will be implemented in each direction on Sefako Makgatho Drive.

According to information received from KBK Engineers (Pty) Ltd, who are the design engineers responsible for the designs of these upgrades, construction of the first phase of these upgrades could commence as early as mid-2023.

Refer the project locality in relation to the PWV network on the following page.



4-2: Planned Provincial Road Network

4.3 Access

A single access to the development is proposed off Intaba Street which is classified as a Class 4b residential collector road past the site. Note that the final position of the access will be confirmed as part of the submission of the SDP for the development. It can, however, be confirmed that the access will be located on the south-eastern boundary of the site on Intaba Street and that there is ample sight distance available in all directions on this road in particular.

A conceptual layout of the proposed access is shown in **Annexure D** in which it is proposed that a butterfly-type access be implemented. To implement this access configuration, local road widening on the western side of Intaba Street will be required so that a short right turning lane on the northern approach and a short receiving acceleration lane on the southern approach of the access intersection can be implemented.

4.4 Roads Trip Generation

The total number of peak hour trips that will be generated the township is summarized below:

Ptn	Land-Use	Extent	Units	Trip Rate (vph)	Split		Trip Generations		
					In	Out	In	Out	Total
AM Peak Hour									
426 & 679	Residential 4 (120 units/ha)	952	units	0.65	25%	75%	155	464	619
TOTAL AM PEAK HOUR TRIPS GENERATED							155	464	619
PM Peak Hour									
426 & 679	Residential 4 (120 units/ha)	952	units	0.65	70%	30%	433	186	619
TOTAL PM PEAK HOUR TRIPS GENERATED							433	186	619

4.5 Recommended Road Upgrades by the Developer

The following upgrades are proposed for the developer:

Rehabilitation of Intaba Street:

Intaba Street's condition past the site's frontage has significantly deteriorated over the years and it would only degrade further with the added development traffic, latent rights traffic and future growth in the background traffic. Given these poor existing road conditions, it is proposed that the developer rehabilitate this road back to a standard Class 4b road past the site's frontage.

NOTE: The rehabilitation of Intaba Street also forms part of SANRAL's planned upgrades in the area and as a result, the rehabilitation of this road should only be the responsibility of the developer if this development occurs before the implementation of the SANRAL upgrades.

Site Access to Derdepoortpark Ext. 44 :

The developer would be responsible to construct the recommended butterfly-type access to the subject township. To implement this access configuration, a short right turning lane on the northern approach and a short acceleration lane on the receiving end of the southern approach is to be constructed. The access (western) approach is to comprise of two inbound lanes with two outbound lanes and a minimum stacking distance of at least 20m.

Sefako Makgatho Drive (R513) / Intaba Street / Kameeldrift Road:

It is proposed that the developer implement a left turning slip-way at the southern approach of the intersection. Along with this geometric upgrade, updated road markings and timing plans would also be required.

NOTE: The planned SANRAL upgrades at this intersection would comprise of the implementation of additional through lanes in each direction on Sefako Makgatho Drive. In total, there would be four through lanes traveling per direction on Sefako Makgatho Drive. If, however, the subject development occurs before the SANRAL upgrades, then the left turning slip-way would have to be implemented before the SANRAL upgrades as well. This could also imply that when the SANRAL road upgrades are implemented, then this left turning slip-way would have to be reconstructed by SANRAL, if Sefako Makgatho Drive is widened in a southern direction to accommodate the additional through lanes instead of widening in a northern direction by reducing the width of the median island.

Baviaanspoort Road (M15) / Intaba Street:

At the eastern approach of this intersection, road widening would be required to implement a short right turning lane with a dedicated continuous left turning slip-lane. In addition to the geometric upgrades, it is further proposed that this intersection should become signalized by the developer.

Refer to **Annexure E** for Roads layout drawing.

4.6 Upgrades by SANRAL

A key plan of the overall road & intersection upgrades to be implemented by SANRAL in the vicinity of the site is provided in **Annexure F**. This key plan was sourced from KBK Engineers (Pty) Ltd who are the consultants responsible for the designs of these upgrades. Given the large extent of the upgrades, these upgrades will be implemented in phases with the first construction phase planned to start as early as mid-2023 based on information received from the design engineers. These timelines are, however, not final at this stage and are subject to change. The following upgrades are planned in the vicinity of the Derdepoortpark Ext. 44 township:

Rehabilitation & Extension of Intaba Street: The planned road rehabilitation & extension of Intaba Street forms part of the first phase of the SANRAL-upgrades and is expected to commence mid-2023. As per Section 6.1, the portion of Intaba Street traveling past the site was also recommended to be rehabilitated by the developer. If there are no delays with regards to the implementation of this upgrade then it is likely that this road rehabilitation will be completed before the required upgrades for the developer commences. In the event that this occurs then the 480m length of Intaba Street to be the rehabilitated by the developer would not be required anymore as this would have already been done by SANRAL.

Apart from the rehabilitation of the road as discussed above, this road is also set to be extended in a southbound direction from the south-eastern corner of the site. Approximately 600m south of the site's south-eastern corner, this road's alignment is set to curve in a western direction until it eventually intersects with Baviaanspoort Road (M15) and the new north-south K139 road. At this planned new intersection, the intention is to construct a whole new southern leg which will also intersect with Stormvoël Road (M8) further to the south (see below). This southern approach forms part of the planned alignment of the K139 road.

Baviaanspoort Road (M15) Upgrade (the implementation of the K139): This road upgrade forms part of the first phase of the SANRAL-upgrades and is planned to commence mid-2023. Past the western boundary of the site, this road is a single carriageway undivided road (one lane per direction, this road would be upgraded to K-route standards (i.e., the K139 road) with three lanes traveling per direction that is separated by a median island (dual carriageway road). As mentioned above, Baviaanspoort Road (M15) / the K139 road is set to intersect with the Intaba Street extension with the addition of a new southern leg of the K139 that would follow a new road alignment. This new north-south road alignment is planned to intersect with Stormvoël Road (M8) further to the south.

The geometry of the planned new intersection between Baviaanspoort Road (M15) / K139 / Intaba Street, as per **Annexure F**, comprises the following:

Northern Approach (K139): Three through lanes with two short right turning lanes and one short left turning lane;

Southern Approach (K139): Three through lanes with one short right turning lane and one short left turning lane;

Eastern Approach (Intaba Street): One through lane with one short right turning lane and one short left turning lane; and

Western Approach (Baviaanspoort Road): One through lane with a short right turning lane and two short left turning lanes.

The above-mentioned upgrades make up the first phase of the SANRAL-upgrades and once these upgrades conclude, the T-intersection between Intaba Street and Baviaanspoort Road at the south-western corner of the subject site will be closed off. The intention is for the existing traffic traveling through this T-intersection to redistribute to the newly planned intersection between Baviaanspoort Road (M15) / K139 / Intaba Street, which would have ample capacity to accommodate the expected traffic demand.

Sefako Makgatho Drive (R513) Upgrades: As per **Annexure F**, this road is set to form a grade separated interchange with Baviaanspoort Road / Moloto Road at the position of the existing intersection between these roads. Construction of this upgrade is currently planned to commence end-2024. This specific intersection between Sefako Makgatho Drive / Baviaanspoort Road / Moloto Road was not included as one of the key intersections for the scope of the study as the planned interchange will supersede any minor upgrade that is proposed for the developer at this intersection.

As part of the planned road upgrades on Sefako Makgatho Drive, additional through lanes will also be constructed in each direction. At the intersection between Sefako Makgatho Drive / Intaba Street / Kameeldrift Road, there are currently two through lanes traveling in each direction (east-west) on Sefako Makgatho Drive. The key plan in **Annexure F**, however, indicates that two additional through lanes will be implemented in each direction, which adds up to four lanes traveling per direction. It is to note that at the eastern approach of the intersection, one of the two existing right turning lanes would be utilized as a through lane instead. We are in support of this proposal as the traffic demand on this right turning movement is actually not of such a higher order that it warrants a double right turning lane. By implication of removing the double right turning lane, this would also allow for the signal timing plans of the intersection to not include a protected right turning phase for this movement, resulting in a more efficient overall operation of the intersection.

It is evident that some of the SANRAL-upgrades would supersede some of the development's required upgrades if the construction of the SANRAL-upgrades occurs according to schedule which in turn could complicate the development's services agreement with council. It is therefore suggested that at the time of compiling the services agreement of Derdepoortpark Ext 44, discussions should be held with council to determine/confirm what upgrades the developer should be responsible for.

Furthermore, at the time of compiling the services agreement, more information regarding the final schedule/ phasing of the SANRAL-upgrades are likely to become known which would simplify the

undertaking of this services agreement.

4.7 Internal Road Network

The internal road servicing will consist of approximately of 6 m wide roads.

Internal roads within a 13m road reserve shall be 5.5m wide with a camber. The internal road shall be designed and constructed in accordance with municipal standards.

DRAFT

5 STORMWATER IMPACT ASSESSMENT AND PROPOSED INFRASTRUCTURE

5.1 Description of Existing Stormwater

There is no existing municipal stormwater systems in the vicinity of the development.

5.2 Stormwater Runoff

The development falls within the original Kameeldrift SMP conducted by Messrs. Civil Concepts for the City of Tshwane.

5.2.1 Pre-Development

The following parameters were used in the calculation of the pre-development runoff values:

Parameter	Portion 426		Portion 679	
Contributing Area	37 410 m ²		4 1940 m ²	
Mean Annual Precipitation (MAP)	695 mm		695 mm	
Time of Concentration (T _c)	27 minutes		25 minutes	
Formula	Rational Method		Rational Method	
Type of flow	Overland flow		Overland flow	
Return period	1:2 year	1:20 year	1:2 year	1:20 year
Run-off coefficient	0.21	0.27	0.21	0.27
Peak Flow (ℓ/s)	89	239	110	296

5.2.2 Existing Development

The current zoning is farmland and is therefore equal to the values in Sub-Clause 4.2.1.

5.2.3 Post-Development

Parameter	Portion 426		Portion 679	
Contributing Area	37 410 m ²		4 1940 m ²	
Mean Annual Precipitation (MAP)	692 mm		692 mm	
Time of Concentration (T _c)	15 minutes		15 minutes	
Formula	Rational Method		Rational Method	
Type of flow	Overland flow		Overland flow	
Return period	1:2 year	1:20 year	1:2 year	1:20 year
Run-off coefficient	0.72	0.72	0.72	0.72
Peak Flow (ℓ/s)	536	1042	601	1168

5.3 Details of Proposed New and Upgrades to Stormwater Infrastructure

The new township will require a formal stormwater system to be installed in accordance with municipal standards.

5.3.1 External upstream of Development

The runoff generated from upstream catchments will be cut off by a boundary service located in Intaba Street. The 20 year return period will generate a runoff value of approximately 6.3 m³/s. The cost of a 450 mm ø will be classified as a boundary services and the difference to a 1500 mm ø is an external cost. Refer to Stormwater layout in **Annexure G**.

5.3.2 Floodline Information

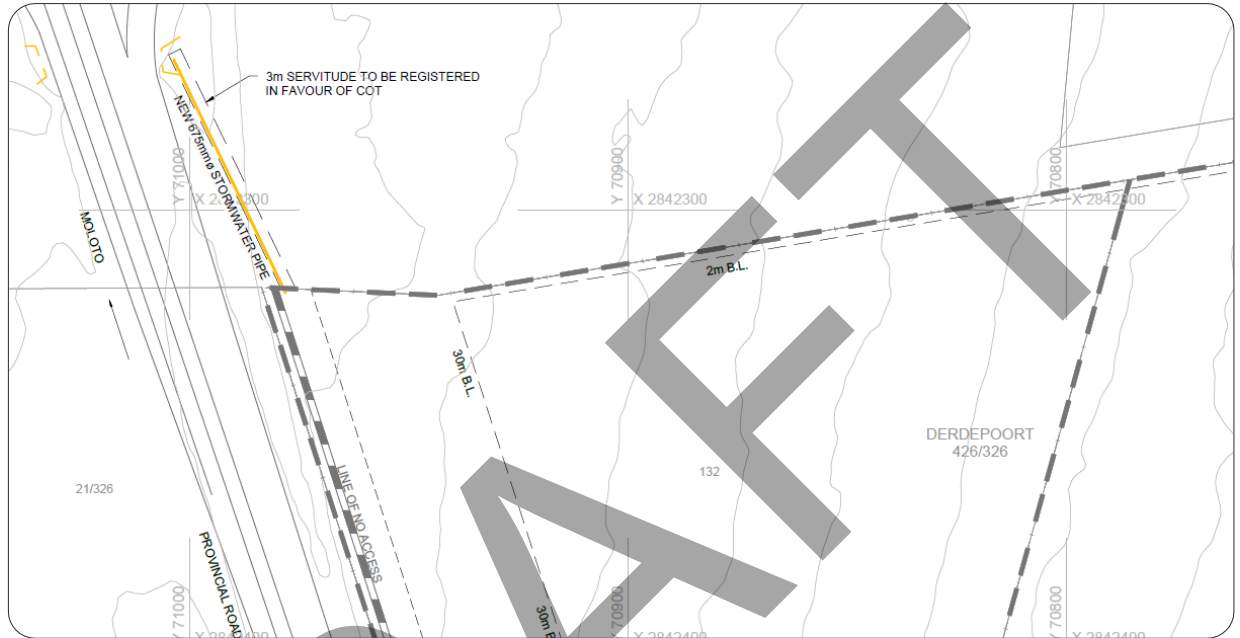
The township is not affected by a floodline.

5.3.3 General drainage arrangement

The site drains in a western direction with a 1.7% slope.

5.3.4 External Upgrades

The developer will be responsible for constructing a 675 mm \varnothing pipeline to connect to the existing culvert under the Baviaanspoort Road. Refer to Stormwater layout in **Annexure G**.



5.3.5 Infrastructure within the development

The stormwater runoff generated within the township will be conveyed by means of an internal piped stormwater network and outlet via a 675 mm \varnothing pipeline at the north western corner of the development.

6 COST ESTIMATES

6.1 Cost Schedules for upgrades required

All rates include for P & G's, professional fees and 15% VAT.

6.1.1 Internal Services

INTERNAL SERVICES				
COST FOR DEVELOPER				
ROADS				
No.	Cost Item	Size/Width/Length/ No/Area	Rate (per meter / m ²)	Cost
5.1.1.1	Access	485.7 m ²	R 1 100	R 534 270
TOTAL INTERNAL SERVICES				R 534 270

6.1.2 Boundary Services

BOUNDARY SERVICES				
ROADS				
No.	Cost Item	Size/Width/Length/ No/Area	Rate (per meter / m²)	Cost
5.1.2.1	Intaba Road	3 940.48 m ²	R 1 100	R 4 334 528
5.1.2.2	Taxi Bay	80 m ²	R 1 100	R 88 000
5.1.2.3	1500 mm dia Stormwater Pipe	399 m	R 6 500	R 2 593 500
TOTAL BOUNDARY SERVICES				R 7 016 028

6.1.3 External Services – Non Offset-able

MUNICIPAL SERVICES				
EXTERNAL SERVICES – NON - OFFSET-ABLE				
ROADS AND STORMWATER				
No.	Cost Item	Area/Length	Rate	Cost
5.1.3.1	Pedestrian Walkway	531 m	R 350	R 185 850
5.1.3.2	Pedestrian Crossing	37.4 m ³	R 900	R 33 660
5.1.3.3	675 mm dia pipe	60 m	R 3 320	R 199 200
5.1.3.4	1500 mm dia pipe	138 m	R 6 500	R 897 000
SUB TOTAL EXTERNAL SERVICES				R 1 315 710

6.1.4 External Services – Provincial Roads

PROVINCIAL ROADS				
EXTERNAL SERVICES – NON - OFFSET-ABLE				
ROADS AND STORMWATER				
No.	Cost Item	Area/Length	Rate	Cost
5.1.4.1	Sefako Makgatho / Kameeldrift Road Intersection	88.29 m ²	R 1 800	R 158 922
5.1.4.2	Intaba / Baviaanspoort Road Intersection	174.41 m ³	R 1 800	R 313 938
5.1.4.3	Traffic Signal - Intaba / Baviaanspoort Road Intersection			R 517 500
SUB TOTAL PROVINCIAL ROADS				R 990 360

6.2 **Estimate of Development Charges**

Please find below the calculated development charges as per the latest approved method of estimation. A summary of the totals are shown below (amounts include VAT):

Roads	-	R 986 040.35
Stormwater	-	R 461 522.05
Combined Total		R 1 477 562.40

6.3 Summary of Cost

	Item	Contribution by CoT	Contribution by Applicant
1	Internal Services		R 534 270
2	Boundary Services Construction Cost		R 7 016 028
3	Non Offset-able External Upgrades		R 1 315 710
4	Offset-able External Upgrades		Nil
5	Estimated Development Charges		R 1 447 562.40
5.1	Roads		R 986 040.35
5.2	Stormwater		R 461 522.05
6.1	Boundary Payable by CoT for Roads	R 2 211 264	
6.2	Boundary Payable by CoT for Stormwater (Difference between 1500 mm ø and 450 mm ø pipe x 399 m)	R 1 719 690	

7 COST ESTIMATES

7.1 Total Project Construction Value (Municipal Services)

R 8 866 008 (1+2+3)

7.2 Total Project Construction Value (Provincial)

R 990 360

7.3 Construction Period and Intended Construction Start Date

The municipal works should commence soon after the service agreement has been signed. The estimated construction period is 6 months.

7.4 Relevant Environmental Authorisations and WULA Requirements

Previous WUL was received and where so required amendments to the WUL will be made prior to start of construction works to take into account any deviations from the original.

7.5 Wayleaves to be obtained from City of Tshwane, Gautrans and SANRAL

A full Wayleave application to all statutory bodies will be applicable. A full approval process will be followed in order to satisfy all municipal departments' requirements, and the full design approved for construction.

7.6 Servitudes

A 3m stormwater servitude will need to be registered over Portion 20 of the Farm Derdepoort 326-JR as well as the R/23 of the Farm Derdepoort 326-JR.

Compiled by:



Werner Stander (PrEng 20060017)
 Civil Concepts (Pty) Ltd

ANNEXURE A

ANNEXURE B

ANNEXURE C

Derdepoortpark Ext. 44

(Proposed New Residential Development to be situated on Portions 426 & 679 of the Farm Derdepoort 326-JR)

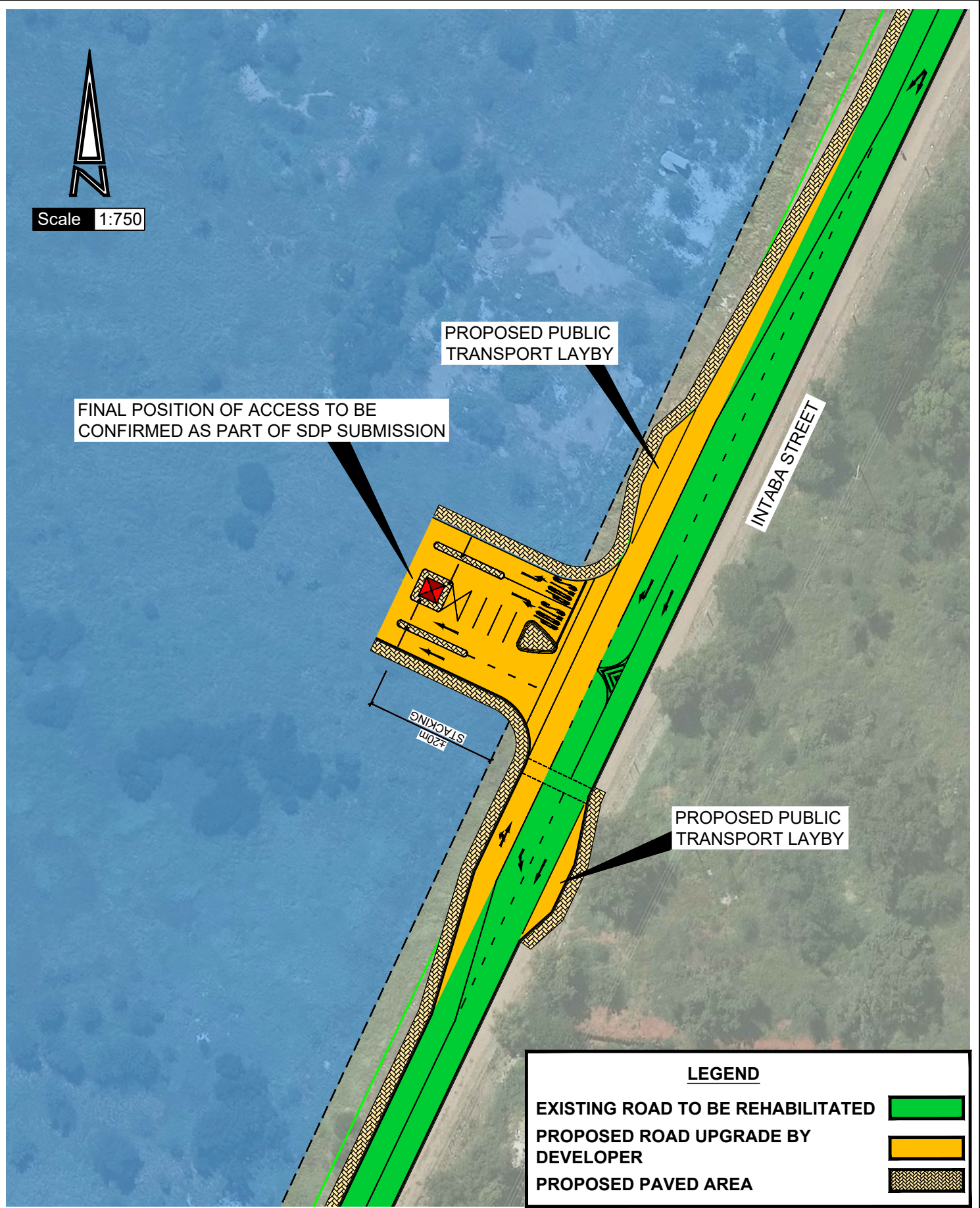
TRAFFIC IMPACT ASSESSMENT (DRAFT-2)

December 2022




ANNEXURE D



Scale 1:750



LEGEND

- EXISTING ROAD TO BE REHABILITATED 
- PROPOSED ROAD UPGRADE BY DEVELOPER 
- PROPOSED PAVED AREA 



Dhubecon Consulting Engineers
41 Via Aurelia Drive
Irene Corporate Corner
Irene, Centurion
Tel: 012 667 5531
Email: admin@dhubecon.co.za

PROJECT: Derdepoortpark Ext. 44

TITLE: **Proposed Site Access Arrangement**

DRAWING STATUS: **TRAFFIC IMPACT ASSESSMENT**

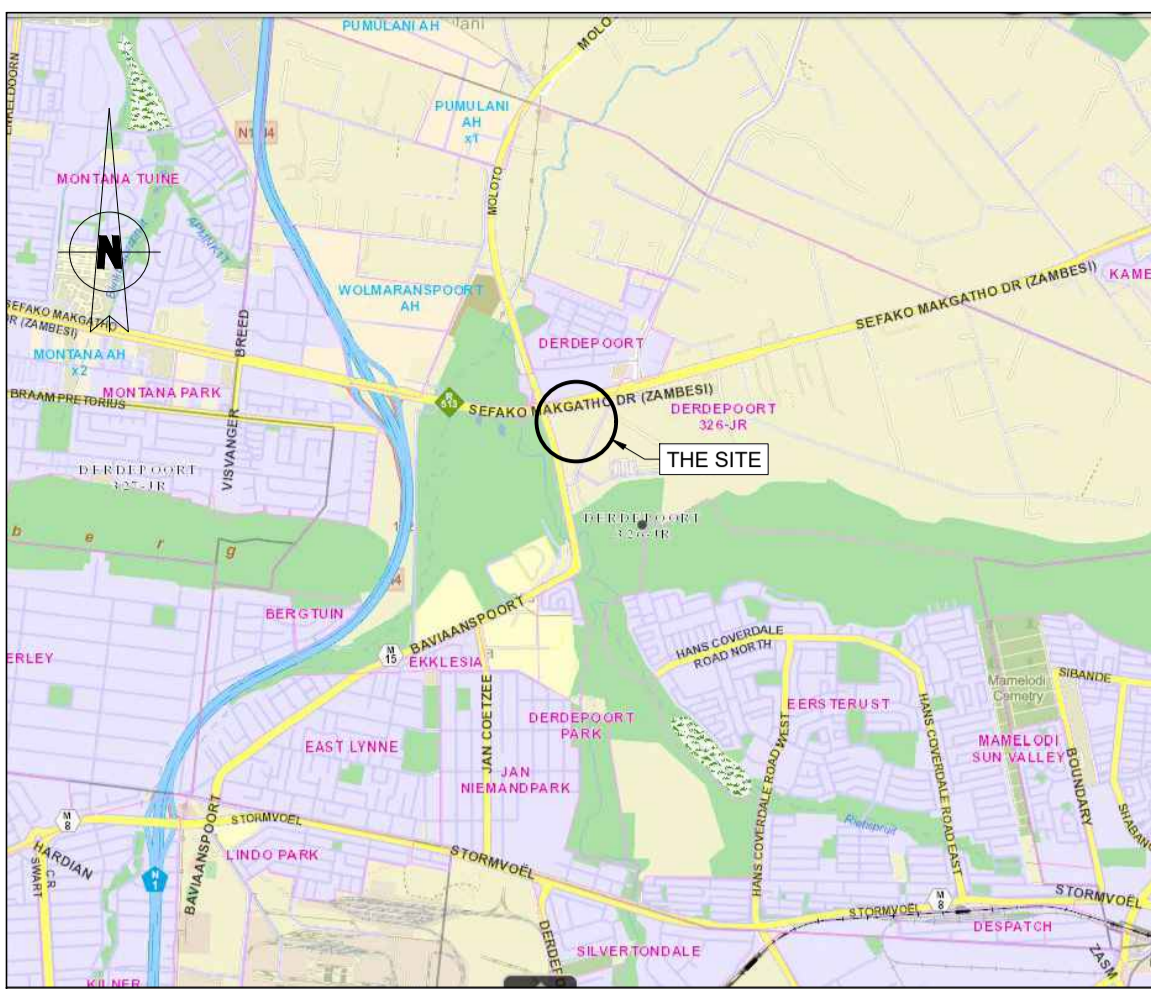
DRAWING No: **0637/CL/02**

PROJECT No: **P0637**

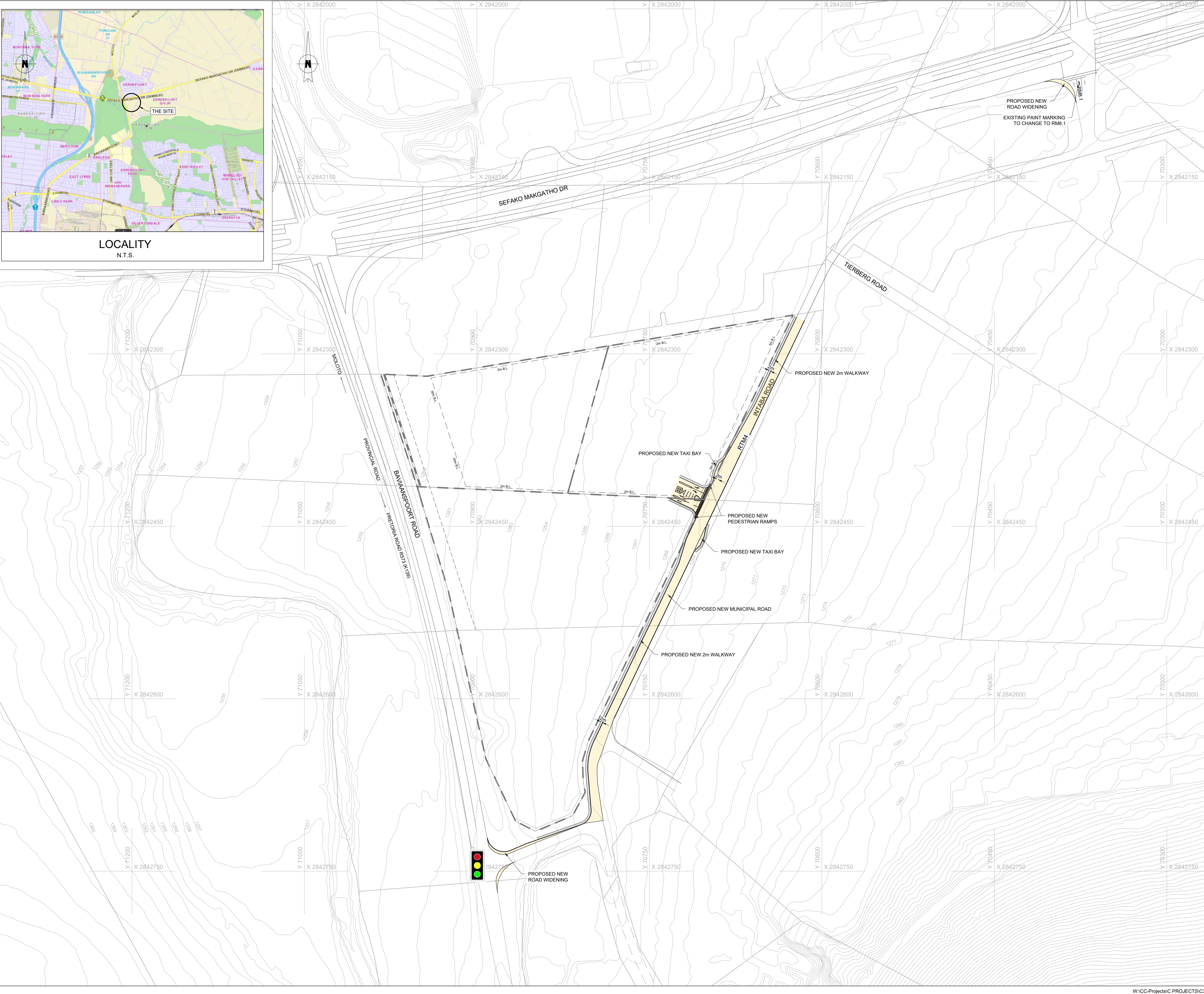
DATE: 2022/11/10

REV: -

ANNEXURE E



LOCALITY
N.T.S.



NOTES AND SPECIFICATIONS

- GENERAL:**
1. ALL MATERIAL AND WORKMANSHIP MUST COMPLY WITH THE REQUIREMENTS OF THE LATEST RELEVANT SABS REQUIREMENTS.
 2. ALL DIMENSIONS ARE IN MILLIMETRES. (UNLESS OTHERWISE SPECIFIED).
 3. DO NOT SCALE FROM THESE DRAWINGS.
 4. ALL DIMENSIONS MUST BE CHECKED AND APPROVED ON SITE.
 5. ALL CONSTRUCTION TO BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR MUNICIPAL CIVIL ENGINEERING WORKS, THIRD EDITION 2005 AND THE STANDARD COT DETAIL DRAWINGS.
 6. THESE DRAWINGS MUST BE READ IN CONJUNCTION WITH THE STANDARD DRAWINGS (IF APPLICABLE).
 7. THIS DRAWING MUST BE READ IN CONJUNCTION WITH THE STANDARD SPECIFICATIONS FOR MUNICIPAL CIVIL ENGINEERING WORKS, SERIES 4.
 8. THE SIGNATURE OR INITIALS ON THIS DRAWING, OF ANY DIRECTOR OF THE PUBLIC WORKS AND INFRASTRUCTURE DEVELOPMENT DEPARTMENT, IN NO WAY REMOVES ANY RESPONSIBILITY WHATSOEVER FROM THE CONSULTANT.
 9. THE CONSULTANT REMAINS RESPONSIBLE TO ENSURE THAT ALL THE GUIDELINES, STANDARD DRAWINGS, STANDARDS AND SPECIFICATIONS OF THE PUBLIC WORKS AND INFRASTRUCTURE DEVELOPMENT DEPARTMENT HAVE BEEN MET AND ARE COMPLIED WITH.
 10. FINAL POSITION OF SERVICES TO BE DETERMINED ON SITE.

- LEGEND:**
- SITE BOUNDARY
 - EXISTING ROAD
 - PROPOSED NEW ACCESS
 - PROPOSED NEW 2m PAVED WALKWAY
 - PROPOSED NEW MUNICIPAL ROAD BY CIVIL CONCEPTS

AMENDMENTS					
NR.	DATE	APPROVED	DESCRIPTION	PAR.	
A	01-03-2022	W.S.	ISSUED FOR APPROVAL	-	-
B	07-04-2022	W.S.	UPDATED WITH EXTERNAL ROAD	-	-
C	30-11-2022	W.S.	EXTENDED ROAD TO END OF NEW TOWNSHIP BOUNDARY	-	-
D	06-12-2022	W.S.	REVISED ROAD LAYOUT	-	-

DESIGNED W. STANDER	DATE 06-12-2022	DRAWN R. WILLERS
DESIGN CHECKED BY W. STANDER	DATE 06-12-2022	INFRASTRUCTURE TECHNICAL INFORMATION MANAGEMENT D.J. CHALMERS

PROJECT STATUS

CONCEPT DRAWING
 TENDER DRAWING
 APPROVED FOR CONSTRUCTION DRAWING
 AS BUILT DRAWING

PROJECT ENGINEER (CONSULTANT) W. STANDER	PROJECT NO. 20060017	DATE 06-12-2022
INITIALS AND SURNAME	SIGNATURE AND Pr. No.	DATE
STRUCTURAL ENGINEER (CITY OF TSHWANE)		

CONSULTANT DETAIL

Civil Concepts (Pty) Ltd
 Consulting Civil & Structural Engineers
 PO Box 36148, Menlo Park, 0102
 Office: +27 12 460 0008
 www.civilconcepts.co.za
 mail@civilconcepts.co.za

CITY OF TSHWANE
 ROADS AND TRANSPORT DEPARTMENT

GROUP HEAD MR. LETLONKANE P. (Pheko) P.O. BOX 1409 PRETORIA 0001	DIVISIONAL HEAD MR. TLHAGALE M.K.P. (Mavem) P.O. BOX 1409 PRETORIA 0001
--	---

DRAWING APPROVED BY DIVISIONAL HEAD
MR. TLHAGALE M.K.P. (Mavem)

SIGNATURE: _____ DATE: _____

LOCATION OF PROJECT

**DERDEPOORT PTN 426 & 679
(DERDEPOORTPARK EXT. 44)**

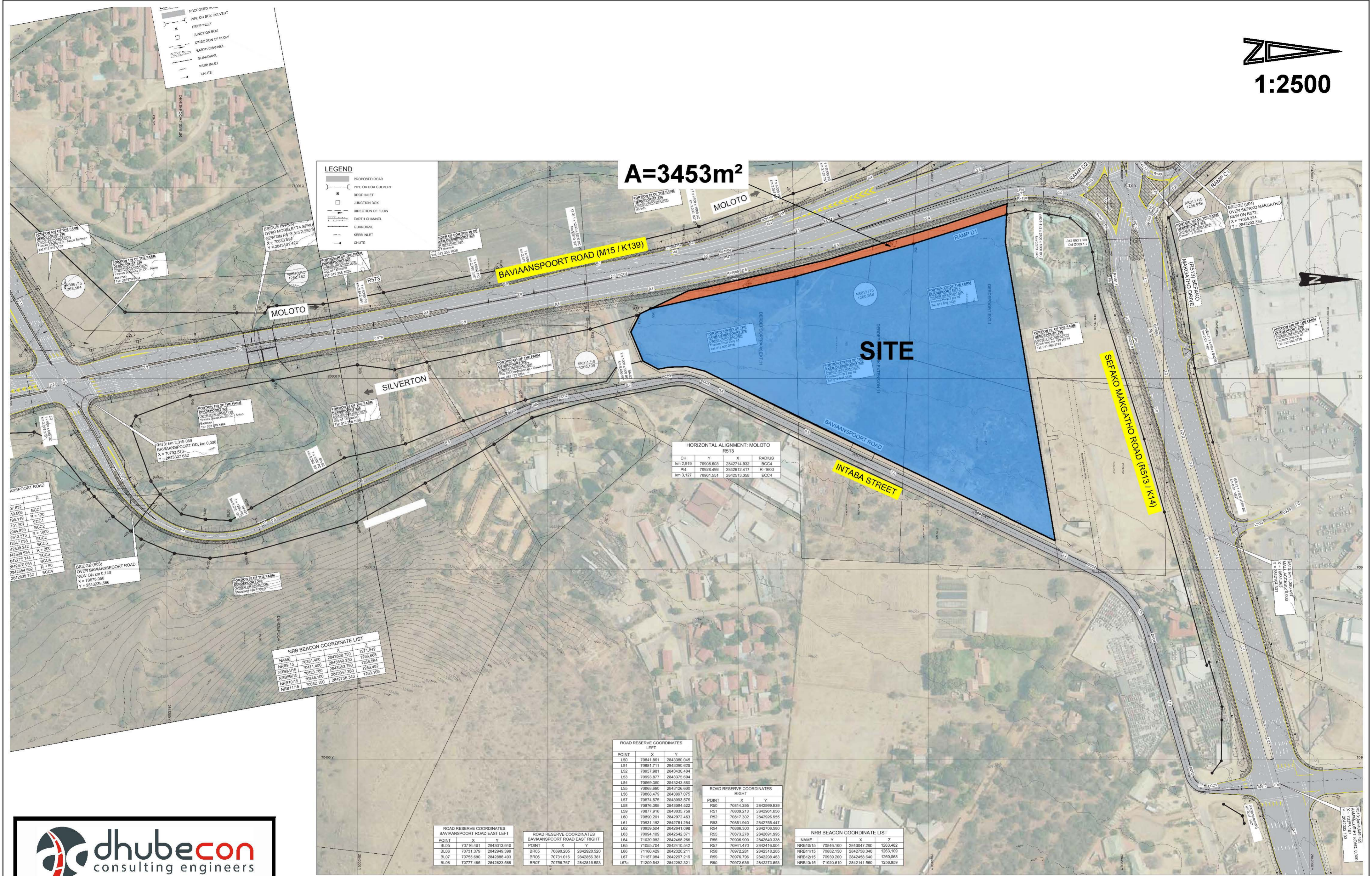
DESCRIPTION OF PROJECT

**ROADS LAYOUT
(SERVICE REPORT)**

WAYLEAVE NUMBER

CONTRACT NO. C3034	PROJECT NO. C3034	
DATE MARCH 2022	SCALE 1:1500	ORIGINAL PAPER SIZE A1
DRAWING NO. C3034-SR-001	SHEET NO. 1 OF 1	REVISION

ANNEXURE F



A=3453m²

LEGEND

- PROPOSED ROAD
- PIPE OR BOX CULVERT
- DROP INLET
- JUNCTION BOX
- DIRECTION OF FLOW
- EARTH CHANNEL
- GUARDRAIL
- KERB INLET
- CHUTE

HORIZONTAL ALIGNMENT: MOLOTO R513

CH	Y	X	RADIUS
km 2.919	70908.603	2842714.932	BCC4
P4	70926.499	2842612.417	R-1600
km 3.127	70961.551	2842513.358	ECC4

NRB BEACON COORDINATE LIST

NAME	X	Y	Z
NRB015	70381.400	2843828.750	1271.842
NRB015	70471.400	2843540.230	1268.668
NRB015	70523.750	2843357.760	1268.564
NRB015	70846.100	2842947.280	1263.462
NRB1015	70862.150	2842756.340	1263.109

ROAD RESERVE COORDINATES LEFT

POINT	X	Y
L50	70841.861	2843380.045
L51	70851.711	2843350.625
L52	70907.981	2843430.034
L53	70993.877	2843376.694
L54	70869.380	284343.880
L55	70868.650	284326.600
L56	70868.478	284307.075
L57	70874.575	2843093.576
L58	70876.365	2843084.522
L59	70877.916	2843035.759
L60	70880.201	2842972.463
L61	70931.192	2842761.254
L62	70959.504	2842641.098
L63	70994.109	2842542.371
L64	71020.082	2842468.296
L65	71025.704	2842410.542
L66	71160.429	2842320.211
L67	71187.084	2842297.219
L67a	71209.543	2842282.321

ROAD RESERVE COORDINATES RIGHT

POINT	X	Y
R50	70814.295	2842999.639
R51	70809.213	2842961.656
R52	70817.322	2842926.556
R53	70851.940	2842755.447
R54	70868.300	2842706.580
R55	70873.276	2842691.995
R56	70906.909	2842545.339
R57	70941.470	2842418.004
R58	70972.281	2842318.205
R59	70976.796	2842298.463
R60	70972.638	2842273.853

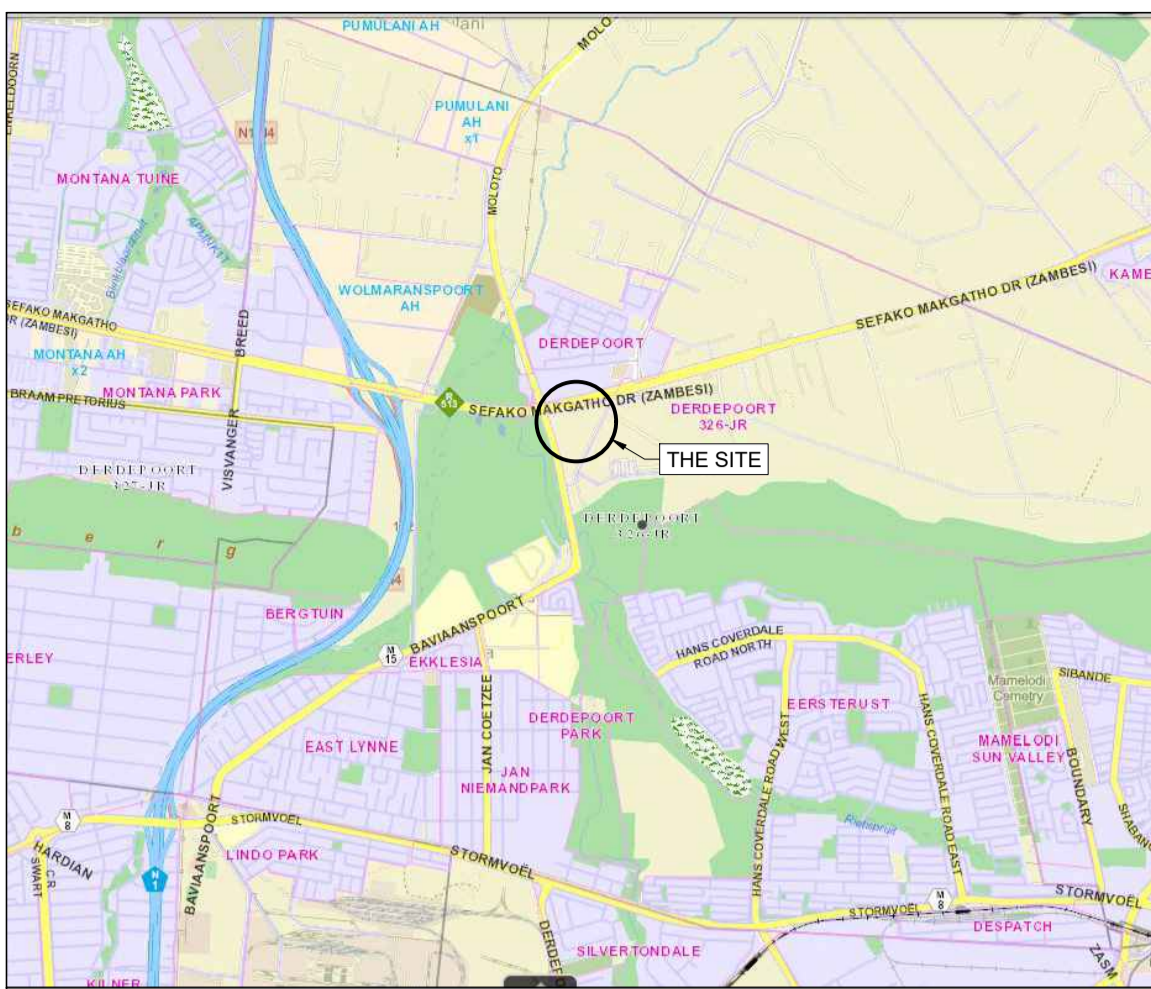
NRB BEACON COORDINATE LIST

NAME	X	Y	Z
NRB1015	70846.100	2843047.280	1263.482
NRB1115	70862.150	2842756.340	1263.109
NRB1215	70936.200	2842458.640	1260.868
NRB1315	71020.610	2842141.560	1256.958

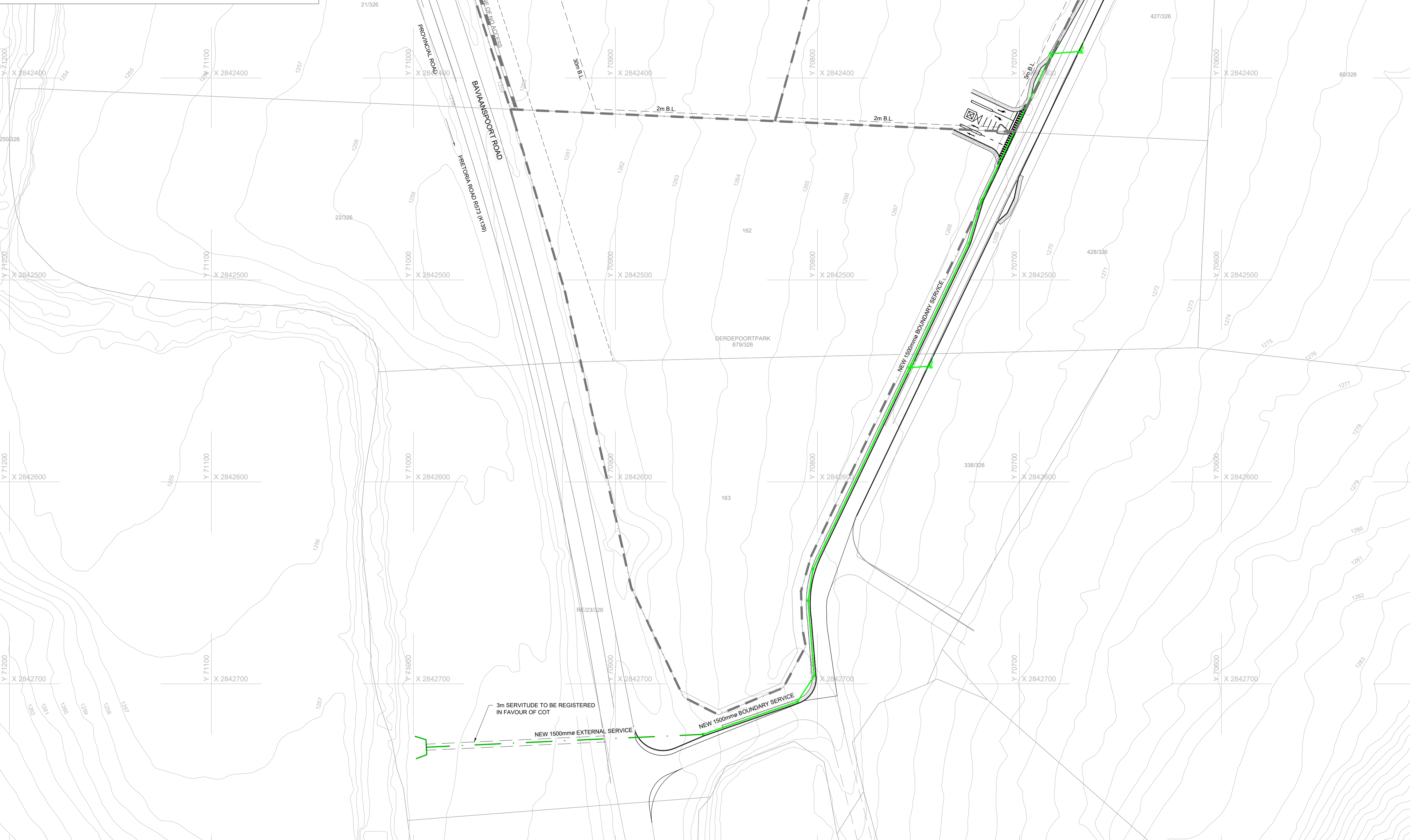


Dhubecon Consulting Engineers
 41 Via Aurelia Drive
 Irene Corporate Corner
 Irene, Centurion
 Tel: 012 667 5531
 Email: admin@dhubecon.co.za

ANNEXURE G



LOCALITY
N.T.S.



NOTES AND SPECIFICATIONS

- GENERAL:**
1. ALL MATERIAL AND WORKMANSHIP MUST COMPLY WITH THE REQUIREMENTS OF THE LATEST RELEVANT SABS REQUIREMENTS.
 2. ALL DIMENSIONS ARE IN MILLIMETRES. (UNLESS OTHERWISE SPECIFIED).
 3. DO NOT SCALE FROM THESE DRAWINGS.
 4. ALL DIMENSIONS MUST BE CHECKED AND APPROVED ON SITE.
 5. ALL CONSTRUCTION TO BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR MUNICIPAL CIVIL ENGINEERING WORKS, THIRD EDITION 2005 AND THE STANDARD COT DETAIL DRAWINGS.
 6. THESE DRAWINGS MUST BE READ IN CONJUNCTION WITH THE STANDARD DRAWINGS (IF APPLICABLE).
 7. THIS DRAWING MUST BE READ IN CONJUNCTION WITH THE STANDARD SPECIFICATIONS FOR MUNICIPAL CIVIL ENGINEERING WORKS, SERIES 4.
 8. THE SIGNATURE OR INITIALS ON THIS DRAWING, OF ANY DIRECTOR OF THE PUBLIC WORKS AND INFRASTRUCTURE DEVELOPMENT DEPARTMENT, IN NO WAY REMOVES ANY RESPONSIBILITY WHATSOEVER FROM THE CONSULTANT.
 9. THE CONSULTANT REMAINS RESPONSIBLE TO ENSURE THAT ALL THE GUIDELINES, STANDARD DRAWINGS, STANDARDS AND SPECIFICATIONS OF THE PUBLIC WORKS AND INFRASTRUCTURE DEVELOPMENT DEPARTMENT HAVE BEEN MET AND ARE COMPLIED WITH.
 10. FINAL POSITION OF SERVICES TO BE DETERMINED ON SITE.

- LEGEND:**
- - - - - SITE BOUNDARY
 - - - - - EXISTING STORMWATER
 - - - - - PROPOSED NEW 675mm INTERNAL STORMWATER PIPE
 - - - - - PROPOSED NEW 3m SERVITUDE IN FAVOUR OF COT
 - - - - - PROPOSED NEW 1500mm BOUNDARY SERVICE
 - - - - - PROPOSED NEW 1500mm EXTERNAL SERVICE

AMENDMENTS				
NR.	DATE	APPROVED	DESCRIPTION	PAR.
A	01-03-2022	W.S.	ISSUED FOR APPROVAL	-
B	07-12-2022	W.S.	UPDATED EXTENTS & ADDED SERVITUDE	-

DESIGNED W. STANDER	DATE 07-12-2022	DRAWN R. WILLERS
DESIGN CHECKED BY W. STANDER	DATE 07-12-2022	INFRASTRUCTURE TECHNICAL INFORMATION MANAGEMENT D.J. CHALMERS

PROJECT STATUS

CONCEPT DRAWING
 TENDER DRAWING
 APPROVED FOR CONSTRUCTION DRAWING
 AS BUILT DRAWING

PROJECT ENGINEER (CONSULTANT) W. STANDER	20060017	07-12-2022
INITIALS AND SURNAME	SIGNATURE AND Pr. No.	DATE
STRUCTURAL ENGINEER (CITY OF TSHWANE)		

CONSULTANT DETAIL

Civil Concepts (Pty) Ltd
 Consulting Civil & Structural Engineers
 PO Box 36148, Menlo Park, 0102
 Office: +27 12 460 0008
 www.civilconcepts.co.za
 mail@civilconcepts.co.za

CITY OF TSHWANE
 ROADS AND TRANSPORT DEPARTMENT

GROUP HEAD MR. LETLONKANE P. (Pheko) P.O. BOX 1409 PRETORIA 0001	DIVISIONAL HEAD MR. TLHAGALE M.K.P. (Mavem) P.O. BOX 1409 PRETORIA 0001
--	---

DRAWING APPROVED BY DIVISIONAL HEAD
MR. TLHAGALE M.K.P. (Mavem)

LOCATION OF PROJECT

**DERDEPOORT PTN 426 & 679
(DERDEPOORTPARK EXT. 44)**

DESCRIPTION OF PROJECT

**STORMWATER LAYOUT
(SERVICE REPORT)**

WAYLEAVE NUMBER

CONTRACT NO. C3034	PROJECT NO. C3034
DATE MARCH 2022	SCALE 1:1000
DRAWING NO. C3034-SR-002	ORIGINAL PAPER SIZE A1
	SHEET NO. 1 OF 1