

- Sealing of surfaces under a bridge or gabion construction should be avoided;
- A plan for the immediate rehabilitation of damage caused to wetlands should be compiled by a specialist registered in accordance with the Natural Scientific Professions Act (No. 27 of 2003) in the field of Ecological Science. This rehabilitation plan should form part of the EMP and a record book should be maintained on site to monitor and report on the implementation of the plan;
- Appropriate road design and traffic control measures are recommended to reduce environmental pollution and animal mortality;
- All storm water structures should be designed so as to block amphibian and reptile access to the road surface;
- A barrier (either prefab concrete wall or galvanized sheeting that extends as a continuous sheet above ground for at least 40cm and below ground for at least 30cm) that will physically block animals from accessing the road surface should be constructed for a distance of 200m on either side of all aquatic and terrestrial underpasses. Holes under barriers should be routinely filled in and areas directly adjacent to the barrier should be kept free of vegetation.

Dr. Johan van der Waals of Terrasoil conducted the wetland study. In his report it was stated that the wetland under investigation is limited to a stream/ watercourse that runs along the eastern border of the site. The catchment of the wetland/ watercourse is situated to the south in a built-up area that comprises of Silver Lakes and its associated developments as well as the N4 highway. The investigation into the wetland on the site indicated that there are several historical impacts and modifiers applicable. The main changes on the site are the cessation of crop production and the increase in dumping of rubble. It is evident that the entire site, excluding the watercourse and shallow soil areas to the southwest was used for the production of crops and therefore tilled. Please refer to Figure 5 below for the wetland delineation on the study area.

Due to the fact that the watercourse is not fed significantly from water emanating from the specific site but rather from water generated upslope in the catchment an extensive buffer is considered unnecessary. Rather, effort should be made to conserve the current riparian zone, stabilise the banks of the channel and remove alien vegetation. Based on the information generated in this document the wetland area is classified as an erosion impacted watercourse with riparian vegetation.

The following conclusion and recommendations have been made by the specialist:

- The structured and swelling soils on the site do not qualify as wetland soils as described in the wetland delineation guidelines. The main reason is the explanation provided earlier regarding the origin of swelling clay minerals as well as the geological driver for the formation of the soils outside of the watercourse area.
- Due to the fact that the water that flows in and through the channel on the site emanates from upslope areas that have been impacted by

human activities and infrastructure development a dedicated buffer on the watercourse will contribute little to its protection. Rather, it is recommended that an integrated storm water plan be generated for the entire site and immediate upslope catchment area.

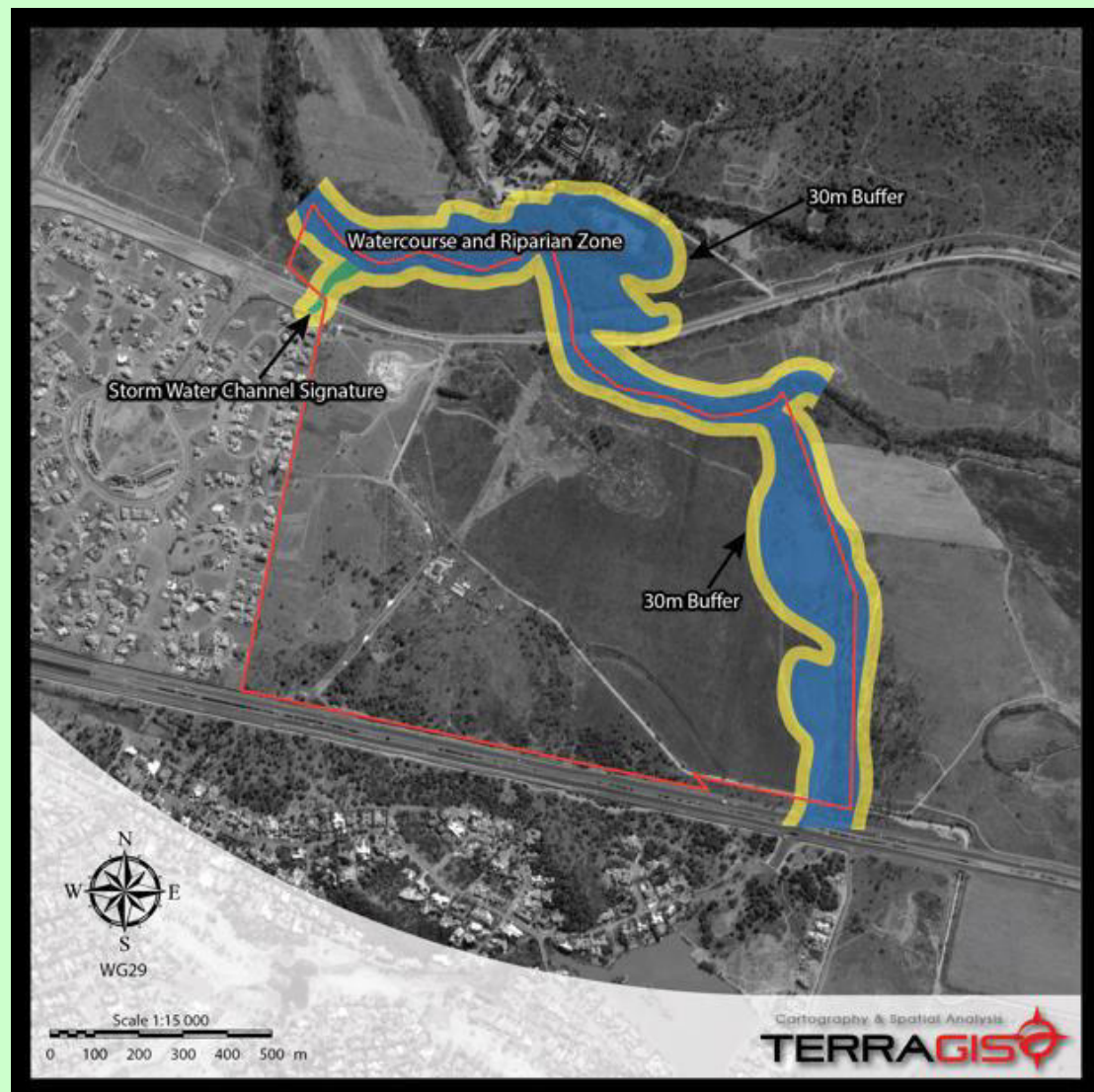


Figure 5: Wetland Delineation

Important mitigation measures for the construction and maintenance of the infrastructure as provided by the wetland specialist:

1. Sediment generation should be prevented through adequate housekeeping during construction as the swelling soils are particularly dispersive and erodible. The specific mitigation measures should be generated by the project engineer and implemented by the site manager. These measures include:
 - a. The establishment of earth bunds on the downslope area to trap sediment.
 - b. Timing of the excavation (if possible) to coincide with the dry season.
 - c. Compaction of fill material on the surface to increase hardness and resistance to erosion. This is not possible if swelling soil material is used and it is recommended non-swelling soil material be used for the infilling.
 - d. Identification of preferential flow areas of water on the surface (as a

- function of local topography) and the establishment of stabilised vegetated or concreted preferential flow areas into the storm water infrastructure.
2. Post development the exposed surface area of the pipeline corridor should be stabilised against erosion on slopes.
 3. Lateral seepage water that accumulates upslope of the compacted fill area of the pipeline trench should be mitigated and managed to allow for flowing over the in-filled trench area without causing erosion. This can be done through the establishment of stabilised overflow areas and vegetation of the soil covering.
 4. The hydrological impact of the trenching and compaction of the fill material cannot be mitigated but is negligible in the presence of a roadbed that runs along the pipeline corridor. In this regard the hydrological attenuation should be conducted along with the approved and established storm water management infrastructure associated with the roads on the site.
 5. Bridge crossing of the watercourse should be stabilised on the banks and within the stream bed making use of the erosion mitigation and control procedures described above.

Was a specialist consulted to assist with completing this section

YES X	NO
------------------------	----

Please note; If more than one specialist was consulted to assist with the filling in of this section then this table must be appropriately duplicated

If yes complete specialist details

Name of the specialist:

Corne Niemandt

Qualification(s) of the specialist:

MSc Plant Science

Postal address:

P.O Box 11375, Maroelana, Pretoria

Postal code:

0161

Telephone:

012 346 3810

Cell:

-

E-mail:

corne@bokamoso.net

Fax:

086 570 5659

Are any further specialist studies recommended by the specialist?

YES

NO
X

If YES, specify:

If YES, is such a report(s) attached?

YES

NO

If YES list the specialist reports attached below

Signature of specialist:

Date:

January 2016 and
November 2016

If yes complete specialist details

Name of the specialist:

Dr Johan van der Waals

Qualification(s) of the specialist:

PhD Soil Science, Pr.Sci.Nat.

Postal address:

PO Box 40568, Garsfontein

Postal code:

0060

Telephone:

012 993 0969

Cell:

082 570 1297

E-mail:

johan@terrasoil.co.za

Fax:

086 274 6653

Are any further specialist studies recommended by the specialist?

YES

NO
X

If YES, specify:

If YES, is such a report(s) attached? YES NO

If YES list the specialist reports attached below

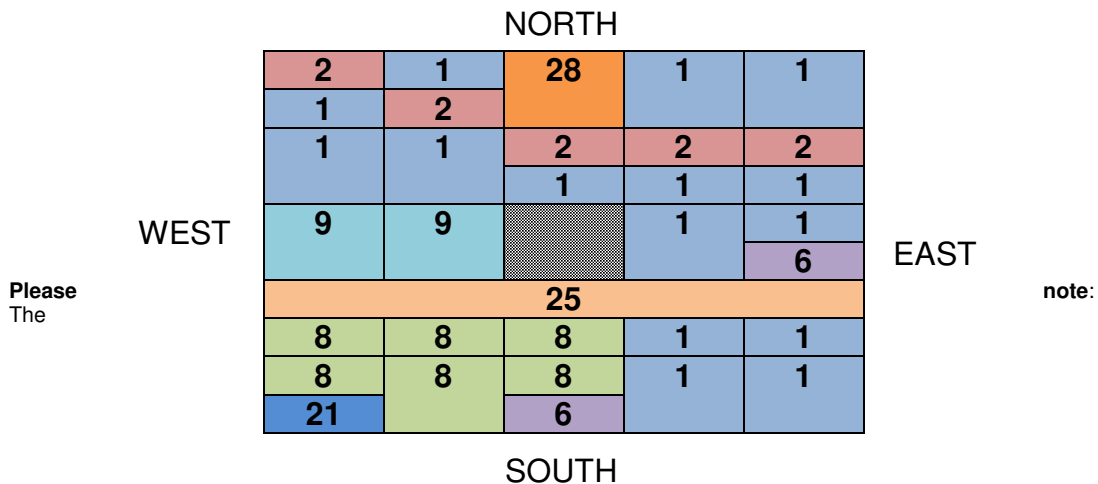
Signature of specialist: _____ Date:

8. LAND USE CHARACTER OF SURROUNDING AREA

Using the associated number of the relevant current land use or prominent feature from the table below, fill in the position of these land-uses in the vacant blocks below which represent a 500m radius around the site

1. Vacant land	2. River, stream, wetland	3. Nature conservation area	4. Public open space	5. Koppie or ridge
6. Dam or reservoir	7. Agriculture	8. Low density residential	9. Medium to high density residential	10. Informal residential
11. Old age home	12. Retail	13. Offices	14. Commercial & warehousing	15. Light industrial
16. Heavy industrial ^{AN}	17. Hospitality facility	18. Church	19. Education facilities	20. Sport facilities
21. Golf course/polo fields	22. Airport ^N	23. Train station or shunting yard ^N	24. Railway line ^N	25. Major road (4 lanes or more) ^N
26. Sewage treatment plant ^A	27. Landfill or waste treatment site ^A	28. Historical building	29. Graveyard	30. Archaeological site
31. Open cast mine	32. Underground mine	33. Spoil heap or slimes dam ^A	34. Small Holdings	
Other land uses (describe):				

NOTE: Each block represents an area of 250m X250m



Department may request specialist input/studies depending on the nature of the land use character of the area and potential impact(s) of the proposed activity/ies. Specialist reports that look at health & air quality and noise impacts may be required for any feature above and in particular those features marked with an "A" and with an "N" respectively.

Have specialist reports been attached YES NO X

If yes indicate the type of reports below

9. SOCIO-ECONOMIC CONTEXT

Describe the existing social and economic characteristics of the area and the community condition as baseline information to assess the potential social, economic and community impacts.

The proposed development (external services) is situated approximately 2km from the Mamelodi residential township. The external services will be for the already approved township development of Riverwalk (previously known as African Renaissance Proper) and for other development in the larger area.

10. CULTURAL/HISTORICAL FEATURES

Please be advised that if section 38 of the National Heritage Resources Act 25 of 1999 is applicable to your proposal or alternatives, then you are requested to furnish this Department with written comment from the South African Heritage Resource Agency (SAHRA) – Attach comment in appropriate annexure

38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as-
- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
 - (b) the construction of a bridge or similar structure exceeding 50m in length;
 - (c) any development or other activity which will change the character of a site-
 - (i) exceeding 5 000 m2 in extent; or
 - (ii) involving three or more existing erven or subdivisions thereof; or
 - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years;
- or
- (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
 - (d) the re-zoning of a site exceeding 10 000 m2 in extent; or
 - (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

Are there any signs of culturally (aesthetic, social, spiritual, environmental) or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or paleontological sites, on or close (within 20m) to the site?
If YES, explain:

YES	NO X
-----	-----------------------

The study area formerly formed part of golf course development, which received an environmental authorisation. No sensitive cultural and historical features were identified in the former EIA and EA issued for the African renaissance golf Course development.

Wetland and Ecological specialists recently investigated the site (early in 2016) and no graves or historical features were identified.

It was decided to also send a heritage specialist and to conduct a Heritage Impact Assessment to establish whether there are any features of cultural and historical importance.

No features with high cultural and historical value were identified on the site and the Cultural and Heritage Report is attached as **Appendix G** of this BAR. Should any graves or artefacts be discovered during the ground works or construction activities, a cultural and historical specialist must be contacted to determine the way forward.

If uncertain, the Department may request that specialist input be provided to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of the specialist if one was already appointed:

Nothing of cultural or historical importance was found on the site and the specialist report is attached as **Appendix G**.

Will any building or structure older than 60 years be affected in any way?

YES	NO X
YES	NO X

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

If yes, please attached the comments from SAHRA in the appropriate Appendix

SECTION C : PUBLIC PARTICIPATION (SECTION 41)

1. ADVERTISEMENT

The Environmental Assessment Practitioner must conduct public participation process in accordance with the requirement of the EIA Regulations, 2014.

2. LOCAL AUTHORITY PARTICIPATION

Local authorities are key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input. The planning and the environmental sections of the local authority must be informed of the application at least thirty (30) calendar days before the submission of the application to the competent authority.

Was the draft report submitted to the local authority for comment?

YES X	NO
----------	----

If yes, has any comments been received from the local authority?

YES	NO X
-----	---------

If "YES", briefly describe the comment below (also attach any correspondence to and from the local authority to this application):

If "NO" briefly explain why no comments have been received or why the report was not submitted if that is the case.

The Draft Basic Assessment was submitted to the City of Tshwane (CoT) for comments. CTMM was also supplied with a review notice (via e-mail) which also supplied the venue for the review of the hard copy of the BAR. Up to date no comments have been received from the CoT.

It is however important to note that CTMM is already aware of the proposed Riverwalk development and the CTMM already approved the proposed development. CTMM (land and environmental planning division) also visited the study area when Bokamoso submitted the Amendment application for the Riverwalk development and the CTMM regards the area below the flood line and within the watercourse buffer zone as part of the larger Riverwalk study area.

Most of the services that are being applied for will belong to the CTMM and the CTMM will be responsible for the maintenance of the services within the CTMM services servitude. The services upgrading application is therefore done on behalf of the CTMM.

The CTMM also assisted the appointed civil engineers with the determination of the services upgradings required and the designs for the proposed services upgrading are in line with the standards as set by the CTMM. The appointed civil engineers are in on-going negotiations with the CTMM and therefore it was not regarded as crucial that the CTMM supply comments.

The rehabilitation works and the proposed cycling track below the flood line were also presented to the Land and Environmental Division of the CTMM earlier in 2016 and the CTMM indicated that they were satisfied with the landscaping and rehabilitation proposals for the areas below the flood line. **Refer to Appendix M for the CTMM approval of the Riverwalk project, which also supported the upgrading of services.**

3. CONSULTATION WITH OTHER STAKEHOLDERS

Any stakeholder that has a direct interest in the activity, site or property, such as servitude holders and service providers, should be informed of the application at least **thirty (30) calendar days** before the submission of the application and be provided with the opportunity to comment.

Has any comment been received from stakeholders?

YES	NO X
-----	---------

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

If "NO" briefly explain why no comments have been received

The Draft Basic Assessment was submitted to the Department of Water and Sanitation (DWS) for comments. DWS also received a review notice (via e-mail) with also supplied the venue for the review of the hard copy of the BAR. Up to date no comments have been received from the DWS.

A special discussion meeting was however arranged with Mr. Piet Ackerman of DWS in order to discuss the S21WUL requirements for the external services. Mr. Ackerman confirmed that the proposed services upgradings will trigger a S21WULA, especially the activities associated with the sewer line upgradings.

Mr. Ackerman however confirmed that they will consider it to issue a GA for the R104/K22 upgradings and the proposed culvert extension.

4. GENERAL PUBLIC PARTICIPATION REQUIREMENTS

The Environmental Assessment Practitioner must ensure that the public participation process is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention should be given to the involvement of local community structures such as Ward Committees and ratepayers associations. Please note that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was flawed.

The EAP must record all comments and respond to each comment of the public / interested and affected party before the application report is submitted. The comments and responses must be captured in a Comments and Responses Report as prescribed in the regulations and be attached to this application.

5. APPENDICES FOR PUBLIC PARTICIPATION

All public participation information is to be attached in the appropriate Appendix. The information in this Appendix is to be ordered as detailed below

Appendix 1 – Proof of site notice

Appendix 2 – Written notices issued as required in terms of the regulations

Appendix 3 – Proof of newspaper advertisements

Appendix 4 – Communications to and from interested and affected parties

Appendix 5 – Minutes of any public and/or stakeholder meetings

Appendix 6 - Comments and Responses Report

Appendix 7 –Comments from I&APs on Basic Assessment (BA) Report

Appendix 8 –Comments from I&APs on amendments to the BA Report

Appendix 9 – Copy of the register of I&APs

Appendix 10 – Comments from I&APs on the application

Appendix 11 - Other

Refer to **Appendix E**

SECTION D: RESOURCE USE AND PROCESS DETAILS

Note: Section D is to be completed for the proposal and alternative(s) (if necessary)

Instructions for completion of Section D for alternatives

- 1) For each alternative under investigation, where such alternatives will have different resource and process details (e.g. technology alternative), the entire Section D needs to be completed
- 4) Each alternative needs to be clearly indicated in the box below
- 5) Attach the above documents in a chronological order

Section D has been duplicated for alternatives times
(complete only when appropriate)

Section D Alternative No. (complete only when appropriate for above)

1. WASTE, EFFLUENT, AND EMISSION MANAGEMENT

Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?

YES	NO
X	
Not yet available	

If yes, what estimated quantity will be produced per month?

How will the construction solid waste be disposed of (describe)?

During construction, the disposal of solid waste will be the responsibility of the main contractor appointed by the developer. No construction waste will be dumped on the study area. The construction waste will be temporarily stored on the section of the Riverwalk study area that is above the 1:100-year flood line and outside the wetland buffer area.

The temporary waste storage area on the Riverwalk site have already been identified and the waste generated by the construction works referred to in this application will also be stored in such areas. The demarcated area must be easily accessible for dumping trucks to collect waste. The waste, including builder's rubble, will be carted to a nearby registered landfill site.

Such activities have already been authorised in the Amendment granted by GDARD for the Riverwalk development.

Where will the construction solid waste be disposed of (describe)?

All solid waste resulting from construction activities will be disposed to the nearest registered landfill site that is allowed to take building rubble. No solid waste will be dumped on open or adjacent properties.

Will the activity produce solid waste during its operational phase?

YES	NO
	X
N/A	

If yes, what estimated quantity will be produced per month?

How will the solid waste be disposed of (describe)?

Not applicable

Has the municipality or relevant service provider confirmed that sufficient air space exists for treating/disposing of the solid waste to be generated by this activity?

YES	NO
	N/A

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?

Apart from the on-going removal of weeds and exotic invaders, the activity will not generate any waste during its operational phase.

As mentioned building rubble and associated waste generated during the construction phase will be the responsibility of the contractor which will have an arrangement with the registered landfill site for the dumping of waste.

Note: If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?

YES	NO X
-----	-----------------------

If yes, inform the competent authority and request a change to an application for scoping and EIA.

Is the activity that is being applied for a solid waste handling or treatment facility?

YES	NO X
-----	-----------------------

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Describe the measures, if any, that will be taken to ensure the optimal reuse or recycling of materials:

It is proposed that all waste construction materials be sorted into recyclable and non-recyclable materials. The recyclable materials should be re-used wherever possible or disposed of by a reputable recycling company.

Liquid effluent (other than domestic sewage)

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?

YES	NO X
-----	-----------------------

If yes, what estimated quantity will be produced per month?

If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the liquid effluent to be generated by this activity(ies)?

YES	NO
-----	----

Will the activity produce any effluent that will be treated and/or disposed of on site?

Yes	NO X
-----	-----------------------

If yes, what estimated quantity will be produced per month?

m ³	
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If yes describe the nature of the effluent and how it will be disposed.

Not applicable

Note that if effluent is to be treated or disposed on site the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA

Will the activity produce effluent that will be treated and/or disposed of at another facility?

YES	NO X
-----	-----------------------

If yes, provide the particulars of the facility:

Facility name:			
Contact person:			
Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

Not applicable

Liquid effluent (domestic sewage)

Will the activity produce domestic effluent that will be disposed of in a municipal sewage system?

YES	NO X
-----	-----------------------

If yes, what estimated quantity will be produced per month?

N/A	
------------	--

If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the domestic effluent to be generated by this activity(ies)?

YES	NO X
-----	-----------------------

Will the activity produce any effluent that will be treated and/or disposed of on site?

YES	NO X
-----	-----------------------

If yes describe how it will be treated and disposed off.

Not applicable

Emissions into the atmosphere

Will the activity release emissions into the atmosphere?

YES	NO X
YES	NO

If yes, is it controlled by any legislation of any sphere of government?

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the emissions in terms of type and concentration:

The proposed development will not generate any emissions.

2. WATER USE

Indicate the source(s) of water that will be used for the activity

Municipal	Directly from water board	groundwater	river, stream, dam or lake	other	
					<p>the activity will not use water during its operational phase as it is services, bridge etc.</p> <p>DWS confirmed that there are existing lawful water uses on the study area and such rights are currently being transferred to the applicant. If any water is required for construction purposes, the water-usage will be in line with the existing lawful water-uses confirmed for the site.</p>

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:

Not applicable

If Yes, please attach proof of assurance of water supply, e.g. yield of borehole, in the appropriate Appendix

Does the activity require a water use permit from the Department of Water Affairs?

<p>YES DWS confirmed that a S21 WUL will be required for the installation of the services adjacent to the river and DWS also confirmed that they will consider it to issues a GA for the K22 road upgradings.</p>	<p>NO</p>
--	-----------

If yes, list the permits required

In terms of the Section 21 of the National Water Act, the developer will need a Section 21 WUL (Sections 21 (c) and (i) licenses. A GA application will be submitted for the R104/K22 road upgradings.

If yes, have you applied for the water use permit(s)?

<p>YES</p>	<p>No X</p>
<p>YES</p>	<p>NO</p>

If yes, have you received approval(s)? (attached in appropriate appendix)

3. POWER SUPPLY

Please indicate the source of power supply e.g. Municipality / Eskom / Renewable energy source

Not applicable

If power supply is not available, where will power be sourced from?

Not applicable

4. ENERGY EFFICIENCY

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

Not applicable

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

Not applicable

SECTION E: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts as well as the impacts of not implementing the activity (Section 24(4)(b)(i)).

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summarise the issues raised by interested and affected parties.

A Public Participation Process was conducted in accordance with the PP requirements as set out in the National Environmental Management Act, 1998 (Act No 107 of 1998) and the new Amended Environmental Impact Assessment Regulations, December 2014. The PP guidelines as published by DEA were also considered.

- Site notices were erected (27 May 2016) at prominent points on and around the study area.
- Flyers were distributed (27 May 2016) to the neighboring properties and estates/ developments that may be affected by the proposed development. Due to accessibility and security issues it is not always possible to personally deliver notices and BID documents to I&APs. Representatives of such estates are then informed of a proposed development and flyers and Background Information Documents (BIDs) are then sent to representatives of such estates and to other possible I&APs (tenants and land-owners) and stakeholders via email, fax and registered mail.
- Registered mail was sent to all surrounding land owners within a 100m radius of the study area.
- Notices regarding the project were e-mailed and faxed to the councilors in the area and possible stakeholders in the area.
- An advertisement was placed in the "Beeld" newspaper on 30 May 2016.

After the Draft Basic Assessment Report was available for review, an errata notice was sent out to all registered I&AP's and stakeholders to inform them of the road upgrades that will form part of this application and it will be included in the Final Basic Assessment Report.

Some correspondence with questions was received from I&AP's on this application. These have been noted and addressed in the Issues and Comments Report.

It is the opinion of Bokamoso that the Public Participation process followed was extensive and transparent. All the issues and comments raised by the I&APs, organs of state and stakeholders were addressed in the BAR and in the issues and response report. Mitigation measures were incorporated in the EMPr attached as **Appendix H**.

Summary of response from the practitioner to the issues raised by the interested and affected parties (including the manner in which the public comments are incorporated or why they were not included)
(A full response must be provided in the Comments and Response Report that must be attached to this report):

All comments received on the application were incorporated into an updated Comments & Response Report and addressed in this Final Basic

Assessment Report. **Please refer to Appendix E**

2. IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION AND OPERATIONAL PHASE

Briefly describe the methodology utilised in the rating of significance of impacts

significance Description Methodology

The significance of Environmental Impacts was assessed in accordance with the following method:

Significance is the product of probability and severity. Probability describes the likelihood of the impact actually occurring, and is rated as follows:

Likelihood	Description	Rating
Improbable	Low possibility of impact to occur either because of design or historic experience	2
Probable	Distinct possibility that impact will occur	3
Highly probable	Most likely that impact will occur	4
Definite	Impact will occur, in the case of adverse impacts regardless of any prevention measures	5

The severity factor is calculated from the factors given to "intensity" and "duration". Intensity and duration factors are awarded to each impact, as described below.

The Intensity factor is awarded to each impact according to the following method:

Intensity	Description	Rating
Low intensity	Natural and man-made functions not affected.	1
Medium intensity	Environment affected but natural and man-made functions and processes continue.	2
High intensity	Environment affected to the extent that natural or man-made functions are altered to the extent that it will temporarily or permanently cease or become dysfunctional.	4

Duration is assessed and a factor awarded in accordance with the following:

Duration	Description	Rating
Short term	<1 to 5 years - Factor 2	2
Medium term	5 to 15 years - Factor 3	3
Long term	Impact will only cease after the operational life of the activity, either because of natural process or by human intervention.	4
Permanent	Mitigation, either by natural process or by human intervention, will not way or in such a time span that the impact can be considered transient.	4

The severity rating is obtained from calculating a severity factor, and comparing the severity factor to the rating in the table below. For example:

$$\begin{aligned}
 \text{The Severity factor} &= \text{Intensity factor} \times \text{Duration factor} \\
 &= 2 \times 3 \\
 &= 6
 \end{aligned}$$

A Severity factor of six (6) equals a Severity Rating of Medium severity (Rating 3) as per table below:

Severity Factor	Severity	Rating
6	Medium	3

Calculated values 2 to 4	Low Severity	2
Calculated values 5 to 8	Medium Severity	3
Calculated values 9 to 12	High Severity	4
Calculated values 13 to 16	Very High severity	5

A Significance Rating is calculated by multiplying the Severity Rating with the Probability Rating.

Significance	Rating	Influence
Low significance	Rating 4 to 6	Positive impact and negative impacts of low significance should have no influence on the proposed development project.
Medium significance	Rating >6 to 15	Positive impact: Should weigh towards a decision to continue Negative impact: Should be mitigated to a level where the impact would be of medium significance before project can be approved.
High significance	Rating 16 and more	Positive impact: Should weigh towards a decision to continue, should be enhanced in final design. Negative impact: Should weigh towards a decision to terminate proposal, or mitigation should be performed to reduce significance to at least medium significance rating.

Briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the construction phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

Proposal

Potential impacts	Significance rating of impacts	Proposed mitigation	Significance rating of impacts after mitigation	Risk of the impact and mitigation not being implemented
PLANNING PHASE				
Adverse Impacts				
Cultural/Historical				
Low Potential for destroying potential paleontological finds.	Low	It is not anticipated that any graves or important cultural findings will be discovered during the construction of the external services. In addition, the study area already went through the process of obtaining Environmental Authorisation and therefore it is not seen as necessary to conduct a Heritage Impact Assessment for the proposed external services.	Low	Low risk of study not being conducted.
Environmental legal compliance				
No financial provision for environmental management during construction and operational phase	Moderate	Developer to budget for environmental mitigation measures such as eradication of alien plant within the development site, specialist that might be required if archaeological finds are unearthed during construction, or sensitive fauna or flora is identified during construction. Developer also to budget for ECO to be part of the development team. WULA required for water uses associated with wetland.	Low	Developer might omit budgeting for environmental monitoring
Ecological Sensitive areas				
Destruction of ecological sensitive areas identified on site	Moderate	During the site investigation, it was confirmed that the proposed external services layout will avoid the sensitive wetland areas as far as possible however some services will take place below the flood line area and within the wetland buffer and therefore the associated listed activities have been applied for. This wetland area must be rehabilitated and must be left as natural areas which will contribute to the aesthetics of the approved development. All sensitive areas are to be denoted as NO-GO areas during construction.	Low	Degradation of the wetland area
Wetland functioning				
The proposed development could potentially negatively impact on the wetland/river bordering the site.	Moderate	A wetland/river bordering the proposed external services footprint must be protected by using bio-swales to filter storm water before it enters the wetland.	Low	If storm water is diverted from wetland, wetland will

				be protected.
Protected fauna				
Potential presence of Bullfrog species	Low	Storm water structure design should block amphibians from entering the road surface.	None	Design parameter might be omitted from final design drawings.
Habitat				
Destruction of Wooded Riverine Vegetation	Moderate	Grassland occurring within the footprint of the proposed developed is regarded as sensitive. The Riverine Vegetation is modified due to erosion and deposition of materials on an accelerated basis due to intensifying human activities upslope in the catchment.	Low	Low risk of total destruction of riverine vegetation occurring on site
Roads and Traffic				
Impact on provincial and national roads	Moderate	Considering the proposed development is situated along the R104/K22 and the N4, the developer must obtain approval from SANRAL for construction of access associated with the development. SANRAL already issued the wayleave for the proposed upgradings. During road upgrades, traffic flow should be regulated and should it be necessary a point's person should be visible on area of concern. Warning signs should also be erected to make drivers aware of the road works.	Low	SANRAL could object to the development
Hydrology & groundwater				
Impacting wetland functionality	Moderate	The proposed services upgradings will require a section 21 (c) and (i) license and DWS confirmed that they will consider it to issue a GA for the proposed R104/K22 upgradings.	None	WULA in progress
CONSTRUCTION PHASE				
Beneficial Impacts				
Institutional Environment				
The proposed development activity compliments proposed developments in the area i.e. the approved development on the site	High	None due to positive impact.	None	No risk due to positive impact
Social & Economic Environment				
Creation of Job opportunities during construction and operational phase	Moderate	The proposed external services will create job opportunities during the construction phase of the project. It is recommended that local employment	None	No risk due to positive

of the project.		be sourced.		impact
Fauna & Flora				
Eradication of invasive plant species.	High	Eradication of invasive plant species during the construction phase would benefit the biophysical environment. Not necessary to mitigate.	None	No risk due to positive impact
Adverse Impacts				
Services				
Disruption of services to adjacent properties during connecting of newly installed services.	High	Neighbours are to be informed of any service disruptions due to connecting newly installed services at least 48 hours prior to service disruption. Service disruption should be as short as possible.	Low	Low risk due to communication
Protected fauna				
Potential presence of Bullfrog species	Low	Contractors should be made aware of potential presence of Bullfrogs. Take note no bullfrogs were identified during the site investigations. If encountered during the construction phase a Herpetologist should conduct assessment.	Low	Contractors could ignore the presence of Bullfrogs.
Ecological Sensitive areas				
Destruction of ecological sensitive areas identified on site	High	All sensitive areas are to be denoted as No-Go areas during construction. ECO to monitor. However, authorised activities may proceed in these areas if mitigation measures and specialist recommendations are in place.	Low	Contractors could disobey signage.
Geology & Soils				
Collapse of structures	Low	Recommendations made by engineers to be incorporated into design and constructed as per design.	Low	Structures collapsing
If not planned and managed correctly topsoil will be lost.	Low	<ul style="list-style-type: none"> • Topsoil removed from the proposed excavations should be stored separately from all stockpiled materials and subsoil, according to the stockpiling methods as described below. The stockpiled topsoil should be used for rehabilitation and landscaping purposes after construction has been completed; • The installation of services could leave soils exposed and susceptible to erosion. Soils should be stored adjacent to the excavated trenches that are excavated to install services, and this should be filled up with the in-situ material as the services are installed. All stones and rocks bigger than 80 mm should be removed from the top layer of soil and these disturbed areas should be re-vegetated immediately after works in a specific area are completed to prevent erosion; • Excavations on site must be kept to minimum and done only one section at a time. Excavated soils must be stockpiled directly on the demarcated area on site. • Considering that the proposed services occurs in an approved development with very low to medium agricultural potential, and with the mitigation 	Low	Soil erosion could occur if mitigation is not implemented

		<p>measures proposed the residual adverse impact of the development on the soils is anticipated to be low.</p> <ul style="list-style-type: none"> • Topsoil and sub-soil must be dumped above the 1:100 year flood line and outside the watercourse buffer areas in designated soil storage areas of the Riverwalk development site. 		
Air quality pollution				
Construction during the dry and windy season could cause excessive dust pollution during construction works.	Low	Regular and effective damping down working areas (especially during the dry and windy periods) must be carried out to avoid dust pollution that will have a negative impact on the surrounding residents and the N4 highway. When necessary, these working areas should be damped down at least twice a day.	Low	If mitigation is not implemented drivers visibility could be impaired.
Nuisance to neighbours and road users in terms of dust generation due to construction during the dry and windy season.	Moderate	The application site must be damped at a regular basis with water to prevent dust pollution to nearby residential area and commuters utilising R104/K22 and the N4 highway.	Low	If mitigation is not implemented residents could complain about nuisance dust.
The noise created by earthmoving machinery will result in an increase in ambient noise levels. This will be short term, being generated only during the day.	Low	All construction activities must be restricted to normal working hours from 8:00 in the morning to no later than 18:00 in the afternoons. No construction may take place on Sundays and public holidays.	Low	If mitigation is not implemented residents could complain about nuisance noise.
Habitat				
Destruction of wooded riverine vegetation	Low	It is recommended that natural vegetation be retained as far as possible. Excavations for services should be done only as necessary and the footprint of disturbance should be limited.	Low	Low risk of total destruction of grassland occurring on site
Hydrology & groundwater				
Impacting wetland functionality	Moderate	The proposed services upgradings will require a section 21 (c) and (i) license	Low	If mitigation is

		and DWS confirmed that they will consider it to issue a GA for the proposed R104/K22 upgradings. Conditions associated with this WUL must be adhered to during construction.		not implemented Wetland function could be impaired.
Increased stormwater run-off volumes and velocity	Low	Due to the clearing of vegetation the volume of storm water run-off will increase as well as the velocity. Temporary storm water management measures should be implemented to manage storm water during the construction phase.	Low	If storm water infrastructure is inadequate, erosion could occur.
Hydrocarbon pollution of surface and ground water	Moderate	Temporary storm water management measures should be implemented to manage storm water during the construction phase.	Low	Run-off can pollute the wetland area.
Excavated materials that are stockpiled in wrong areas can interfere with the natural drainage.	Low	The proposed development site is flat; however, an area must be allocated for stockpiling of topsoil before any construction take place on the application site. Topsoil and sub-soil must be dumped above the 1:100 year flood line and outside the watercourse buffer areas in designated soil storage areas of the Riverwalk development site. A sediment fence or barrier must be constructed around the stockpile, to prevent soil from washing away by rain or any water.	Low	If mitigation is not implemented, topsoil could be lost.
Construction during the rainy season can cause delays and damage to the environment.	Low	It is recommended that the construction phase be scheduled for the winter months; It is also recommended that the precautionary measures be taken in order to prevent the extensive loss of soil during rainstorms. Large exposed areas should adequately be protected against erosion by matting or cladding; Measures should be implemented during the rainy season to channel storm water away from open excavations and foundations.	Low	If mitigation is not implemented, erosion could occur.
Roads and Traffic				
Impact on provincial and national roads	Moderate	Considering the proposed development is situated along the R104/K22 and the N4, the developer already received a wayleave from SANRAL which authorises the proposed road upgradings. SANRAL environmental division requested that Balwin obtain their own EA for the proposed road upgradings to the R104/K22 and indicated in an e-mail that they	Low	If mitigation is not implemented, SANRAL could object to the

		are of the opinion that only Activity 19 will be triggered.		development
Heavy vehicle traffic increase could disrupt the surrounding landowners' daily routines.	Low	Heavy vehicles responsible for material deliveries must be instructed to only use the main roads during off-peak hours.	Low	If mitigation is not implemented , traffic flow could be negatively affected.
Provision for safe and effective traffic flow.	Moderate	Health and safety mitigation/precautionary measures should be implemented during the construction work with regards to any upgrades near roads with public traffic.	Low	If mitigation is not implemented , motorists' safety could be at risk.
Access to existing properties.	Low	Construction activities should cater for continued access to existing properties, if applicable.	Low	If mitigation is not implemented , residents could complain about accessibility to their properties.
Construction might impact traffic flow.	Moderate	Liaison is required with the responsible traffic authorities to ensure compliance with legal requirements during construction activities. Appropriate signage and barricading will be required to ensure safe construction activities and smooth traffic flow during the construction phase.	Low	If mitigation is not implemented , motorists' safety could be at risk.
Safety and Security				
During the construction phase safety and security problems (especially surrounding residents) are likely to occur.	Moderate	<ul style="list-style-type: none"> • Construction must be completed in as short time as possible. • No construction worker or relative may reside on the construction site during the construction phase. All construction workers must leave the site at the end of a day's work. • A security guard should be appointed on site to prevent any loss of materials and damage to construction equipment. 	Low	If mitigation is not implemented , residents and construction companies could be affected by

				crime.
The excavations associated with proposed external services and upgradings could pose a safety risk to pedestrians.	Moderate	The necessary safety precautions must be in place i.e. excavations must be fenced off with barrier tape; signage must be in place to identify excavations.	Low	If mitigation is not implemented , pedestrians' safety could be at risk.
Construction activities might affect the public e.g. road users	Moderate	Public safety especially that of R104/K22 users is to be catered for during construction phase.	Low	If mitigation is not implemented , motorists' safety could be at risk.
Visual Impact				
Dumping of builder's rubble on neighbouring properties.	Low	A specific location for building rubble must be allocated on site in order to concentrate and collect the building rubble and cart it to a registered landfill site. The allocated area must be out of sight of neighbouring properties not to have a visual impact.	None	If mitigation is not implemented , pollution could occur.
Stockpile areas for construction materials could have a negative visual impact and possibly impair drivers' views.	Moderate	An area on the site must be allocated for the stockpile of construction materials. The area must be situated on the Riveralk study area (above the flood line and outside of the wetland and wetland buffer areas), and must be situated to have a minimal visual impact on the neighbouring area. Stockpiles should be kept to a reasonable height in order to prevent impairing views (line of sight) of drivers utilising the R104/ K22 and the N4.	Low	If mitigation is not implemented , vehicle accidents could occur.
The construction vehicles, the site camp, and other construction related facilities will have a negative visual impact during the construction phase.	Moderate	Before any construction commence on site, an area on site must be demarcated for a site camp. The selected site should not impair views (line of sight) of drivers utilising upgraded roads, nor should it be a distraction.	Low	If mitigation is not implemented , community complaints could occur.
Cultural and Archaeology				
Occurrence of cultural historical assets on the proposed development site.	Low	It is not anticipated that sites or features of cultural/ historical significance will be unearthed during construction; however, if finds are exposed during construction work, it should immediately be reported to an appropriately qualified specialist. Construction workers to be trained in the identification of paleontological finds.	Low	Cultural heritage finds unearthed during construction, could be

				destroyed
Flora & Fauna				
Construction works might cause destruction of protected species	Moderate	<p>No protected species were recorded on site.</p> <p>Considering the proposed external services will be below the flood line and within the buffer of a wetland the following must be applied:</p> <ul style="list-style-type: none"> • Construction personnel should be trained in identification of Bullfrogs species. • The contractors must ensure that no fauna species are trapped, hunted, or killed during the construction phase. • Should any mammal species be encountered during the construction phase, they should be relocated to natural areas in the vicinity. 	Low	If mitigation is not implemented, protected species could be destroyed.
Uncontrolled fires may cause damage and loss to vegetation and fauna in the area.	Low	<ul style="list-style-type: none"> • No fires are allowed on the construction site. • Smoking only allowed in designated areas away from vegetation which could possibly catch fire. • Cigarette disposal facilities should be catered for in the designated smoking areas. 	Low	Protected species could be destroyed.
Waste Management				
Site office, camp and associated waste (visual, air and soil pollution)	Moderate	<p>The site camp should not be located in a highly visual area on the study area, or a screen or barrier should be erected as not have a negative impact on the sense of place.</p> <p>The site camp and the rest of the study area should appear neat at all times; A temporary waste storage point shall be determined and established on site by means of demarcation. This storage points shall be accessible by waste removal vehicles.</p> <p>The temporary storage site may not be highly visible from the properties of the surrounding residents.</p> <p>Waste materials should be removed from the site on a regular basis (at least weekly), to a registered landfill site.</p>	Low	If mitigation is not implemented, community complaints could be received.
Disposal of construction waste and waste materials.	Moderate	<p>All the waste generated by the proposed external services construction must be temporarily stored at a preselected area on site to be carted to a registered landfill site allowed to take building rubble;</p> <p>Waste storage should occur in areas that have already been disturbed.</p> <p>Small general waste containers should be provided along the length of roads to be upgraded to prevent windblown waste;</p> <p>These small waste receptacles must be emptied at the temporary waste storage area on a weekly basis for removal.</p> <p>All waste must be removed to a registered landfill site on a weekly basis. No waste materials may be disposed of on or adjacent to the site;</p>	Low	If mitigation is not implemented, pollution might occur.

		The storage of solid waste on site, until such time that it may be disposed of, must be in the manner acceptable to the local authority; and Records of waste reused, recycled, and disposed must be kept for future reference or inspection by authorities.		
OPERATIONAL PHASE				
Beneficial Impacts				
Social & Economic Environment				
Compatibility with the Local Municipality's development framework.	High	Optimum use of services.	None	No risk due to positive impact.
Upgrade of the R104/K22	High	None due to positive impact	None	No risk due to positive impact
Adverse Impacts				
Fauna and Flora				
Invasive plant species occurrence	Moderate	Alien plant eradication to continue during operational phase of the project. Should any alien plant species occur in the areas where construction work and ground works took place for the installation and upgrading of services, it should be eradicated from the area.	Low	If mitigation is not implemented , invasive plants could spread.
Destruction of the wooded riverine vegetation.	Low	Monitoring of the wooded riverine vegetation and associated wetland area on site post development must take place as well as the occurrence of alien invasive species must be monitored and controlled.	Low	Low risk of total destruction of grassland occurring on site
Cyclist littering and degrading the environment.	Low	Strict rules should be issued to all cyclists and individuals walking in the open space areas in order for no littering to occur. These rules should also include that no one should wander of the set path or into the wetland area.	Low	Cyclists degrading the open space area
Hydrology and groundwater				
Increased storm water run-off volumes and velocity	Low	Due to the impermeable surfaces (specifically the roads and bridge) the volume of storm water run-off will increase as well as velocity. Storm water will have to be effectively channelled and storm water infrastructure will have to be maintained.	Low	If mitigation is not implemented , erosion could occur.

Alternatives:

No alternatives were assessed as there will not be any alternatives for the sewer and water, as mentioned by the engineer. There will also not be an alternative for the

upgrade of the R104/K22. The cycling track alignment is not yet definite but the final alignment will be drawn up for the area where there will be the least environmental impacts.

The storm water structures are not within the wetland, only within the wetland buffer, and the current layout is therefore considered best. The impact of having fewer outlets with a higher concentration of storm water being released is considered to be a much more negative impact as it will impact on the wetland itself. The two options of the bridge, from an environmental point of view, are similar as each design has its own negative and positive impacts. It is suggested that the engineer should get the go-ahead for whichever is the best option from an engineering point of view as this will limit negative impacts during the lifespan/operational phase of the bridge.

No-Go Alternative

Potential impacts	Significance rating of impacts	Proposed mitigation	Significance rating of impacts after mitigation	Risk of the impact and mitigation not being implemented
<p>The no-go alternative will prevent the much-needed upgrading of municipal services and of a sub-standard SANRAL road, which is currently regarded as a road safety hazard due to uneven surfaces. Even though Balwin will assist with the upgrading of the services and the SANRAL road, the surrounding community, SANRAL and the CTMM will also benefit from the proposed services upgradings. This application is also for the rehabilitation of a riparian area and for the implementation of a cycling track that will be open for usage by the public.</p> <p>At present, the area below the flood line is covered with litter and waste heaps and many vagrants were found along the river during the site visits. The Bokamoso specialists were robbed by thieves that were hiding in the bushes along the river during one of the site inspections. One of Balwin's graders were also stolen from the site and Balwin was eventually forced to secure the study area to safeguard their construction equipment and workers. The rehabilitation of the area along the river and the constant exposure of the area to cyclists will assist with the improvement of the security in the area. The No-go option is therefore not regarded as the preferred alternative.</p> <p>Also, take note that a golf course and services upgradings were already approved across the entire study area and this application is for a down-scale from the original golf course activities approved across the areas below the flood line.</p>				

List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

- Geotechnical Investigation
- Flora and Fauna Assessment
- Services report
- Wetland delineation
- Cultural and Heritage Report

Describe any gaps in knowledge or assumptions made in the assessment of the environment and the impacts associated with the proposed development.

There are no known gaps in this assessment.

3. IMPACTS THAT MAY RESULT FROM THE DECOMMISSIONING AND CLOSURE PHASE

Briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the decommissioning and closure phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

Proposal

Potential impacts:	Significance rating of impacts:	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
Geology & Soils				
Soil erosion, siltation, and gully formation.	Low	Compaction of fill material following construction should take place. Topsoil stockpiled should be returned and used for rehabilitation of disturbed areas.	Low	If no mitigation measures are implemented, erosion of fill material could occur.
Loss of topsoil due to poor rehabilitation.	Low	Rehabilitation works must be done immediately after the involved works in an area is completed in order to prevent loss of topsoil and possible erosion.	Low	If no mitigation measures are implemented, loss of topsoil could occur.
Hydrology & Groundwater				
Impacting wetland functionality and groundwater	Moderate	Decommissioning activities within 500m from a wetland poses potential for water pollution. Conditions associated with an approved WUL must be adhered to during decommissioning phase.	Low	If no mitigation measures are implemented, wetland could be negatively impacted.
Not reinstating natural run-off/drainage following completion of the decommissioning phase.	Low	Due to construction/decommissioning activities such as excavations and stockpiling, the natural drainage of the area will temporarily be changed. Following completion of the decommissioning phase and completion of rehabilitation, natural drainage should be reinstated to its former (prior to construction) state.	Low	If no mitigation measures are implemented, natural run-off could be negatively altered.
Demolition works during the rainy season can cause unnecessary delays and damage to the environment, especially damage to existing roads in the area.	Low	Should decommissioning take place in the wetter months, frequent rain could cause very wet conditions, which makes it extremely difficult to do the necessary rehabilitation works of disturbed areas. Wet soils are vulnerable to compaction. Wet conditions often causes delays and the draining of water away from the works (in the case of high water tables) into the water bodies of the adjacent properties, could (if not planned and managed correctly) have an impact on the water quality of these water bodies. Rehabilitation should be planned to take place prior to the onset on the	Low	If no mitigation measures are implemented, the environment could be damaged.

		rainy season i.e. prior to Spring, if possible.		
Safety & Security				
Decommissioning activities could cause danger to drivers and pedestrians.	Moderate	The necessary safety precautions must remain in place until decommissioning phase is concluded i.e. signage must be in place to identify activities in progress.	Low	If no mitigation measures are implemented, erosion of fill material could occur.
Waste Management				
Site office, camp and associated waste (visual, air and soil pollution)	Moderate	Temporary site camp and waste storage areas are to be decommissioned. Disturbed areas are to be rehabilitated and returned to its former state (prior to construction commencing).	Low	If no mitigation measures are implemented, sense of place will be negatively affected.
Disposal of builders waste and waste materials.	Moderate	All waste generated during the decommissioning phase of the project is to be collected and disposed of at a registered landfill site. Records must be kept of waste reused, recycled, and disposed for inspection by authorities.	Low	If no mitigation measures are implemented, the environment will be polluted.
Roads & Traffic				
Heavy vehicle traffic increase could disrupt the surrounding landowners' daily routines.	Low	Heavy vehicles responsible for collecting waste or rehabilitation during the decommissioning phase must be instructed to only use the main roads during off-peak hours.	Low	If no mitigation measures are implemented, residents might complain.
Restrictions of access to surrounding properties and the construction area during decommissioning and closure phases.	Low	To minimize the impacts on local traffic, vehicles associated with decommissioning should avoid using the local road network during peak traffic times. These vehicles should use only specific roads and strictly keep within the speed limits and abide to all traffic laws. No speeding or reckless driving should be allowed. Access to the site for decommissioning vehicles should be planned to minimize the impact on the surrounding network; and Warning signs should be erected on the roads that these vehicles will use, at big crossings/ access roads and on the site if needed.	Low	If no mitigation measures are implemented, residents might complain.
Damage to roads.	Low	Provisions made for temporary access to and from the construction/decommissioning site along local roads should be removed. Any damage to the local road curbs at access points to construction site caused by construction activities should be repaired.	None	If no mitigation measures are implemented, road could be damaged without being repaired.
Access to adjacent properties	Low	Existing accesses to properties should be restored to former state prior to construction having commenced, in order to prevent complaints.	None	Adjacent properties might not be accessible.
Air quality and noise				
Demolition works during the dry and windy season.	Low	Regular and effective damping down of working areas (especially during the dry and windy periods) must be carried out to avoid dust pollution that will have a negative impact on the surrounding environment. When necessary, these working areas should be damped down at least twice	Low	If no mitigation measures are implemented, dust pollution could occur.

		daily.		
The noise created by decommissioning activities will result in an increase in ambient noise levels. This will be short term, being generated only during the day.	Low	All decommissioning and closure activities must be restricted to normal working hours from 8:00 in the morning to no later than 18:00 in the afternoons. No construction/ decommissioning may take place on Sundays and public holidays.	Low	If no mitigation measures are implemented, noise pollution could occur.
Visual Impact				
Dumping of builder's rubble on neighbouring properties.	Moderate	All waste temporarily stored on the construction site during the operational phase has to be removed from the site during the decommissioning phase and prior to the project being regarded as closed.	Low	If no mitigation measures are implemented, pollution could occur resulting in community complaints.
Flora				
Not immediately rehabilitating disturbed areas resulting in spread of invasive plants and weeds.	Moderate	Disturbed areas to be rehabilitated as soon as construction has concluded in order to prevent the spread of invasive plants and weeds.	Low	If mitigation measures is not implemented, invasive species might thrive.
Not rehabilitation with indigenous plant species resulting in spread of aliens.	Moderate	All landscaping should use indigenous plants only, with preference given to endemic plant species where possible.	Low	If mitigation measures is not implemented, invasive species might thrive.

List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

- Geotechnical Investigation
- Flora and Fauna Assessment
- Services report
- Wetland delineation
- Cultural and Heritage Report

Where applicable indicate the detailed financial provisions for rehabilitation, closure and ongoing post decommissioning management for the negative environmental impacts.

Not applicable.

4. CUMULATIVE IMPACTS

Describe potential impacts that, on their own may not be significant, but is significant when added to the impact of other activities or existing impacts in the environment. Substantiate response:

Should the proposed installation and upgrading of services be approved, most cumulative impacts will be related to the construction phase. Services infrastructure has very low environmental impact during its operational phase.

- Potential cumulative impact on the wetland system situated on a part of the border of the proposed development site. Poor stockpiling could lead to topsoil stockpiles washing away and silting up the wetland or storm water infrastructure. Increased storm water run-off due to cleared areas, could lead to erosion and siltation of the wetland. Spilling of hydrocarbons during installation of tanks or during operational phase could potentially end up in the wetland which will negatively affect its functionality. Recommendations made in the EMPr and conditions associated with water use license (still to be issued) should be adhered to.
- Traffic flow could be negatively affected by the proposed construction activities coupled with peak traffic hours. It is thus important that use of R104/K22 be limited to off-peak hours.
- Cumulative negative visual impact on surrounding views due to camp site, movement of construction vehicles, building rubble storage, and construction works etc. This impact may be minimized by locating the site camp and rubble storage area in an area with low visibility from surrounding developments and road networks.
- Background dust pollution caused by traffic could be aggravated by clearing of vegetated areas. Dust control can be applied by means of water trucks, particularly in the dry winter months.
- During the construction phase some safety problems (especially for the surrounding residents and road users) are likely to occur due to construction activities.

As illustrated, these cumulative impacts can be mitigated if activities are correctly planned and measures are implemented to manage activities which could cause any negative cumulative impacts.

5. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that sums up the impact that the proposal and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Proposal

The major impacts that is likely to occur during the construction and operational phase, after management, include:

NATURAL ENVIRONMENT

- Wooded riverine vegetation and wetland habitat to be preserved as far as possible which will be included as open space areas as part of the approved development.
- Functionality of the wetland bordering the development site will not be affected by the construction activities considering stockpiling methods and construction during dry periods, which will prevent loss of topsoil. Temporary storm water management measures will be installed in order to reduce run-off and potential sedimentation towards the wetland.

SOCIAL ENVIRONMENT

- Considering that cleared areas will be dampened it is not foreseen that air pollution will be a concern to residents and road users on the R104/K22 and the N4 highway.
- Construction activities (campsite, rubble storage areas etc.) will be placed out of site from local residents and traffic as far as possible, but might be temporarily visually unpleasant.
- The residents of the approved township will benefit from all the service installations and upgradings as well as road upgrades.
- Surrounding residents might experience intervals of service disruptions. This will be mitigated as far as possible by avoiding this, otherwise notifying the residents.

ECONOMIC ENVIRONMENT

- The approved development (with the proposed service installations and upgradings) will contribute to the economy of the area. The services installations and upgradings specifically will create jobs for skilled and unskilled workers during the construction phase.

Alternative 1

Not applicable

Alternative 2

Not applicable

No-go (compulsory)

The no-go alternative will result in no installation and upgrading of services of the development. No positive impacts are foreseen for the no-go alternative, as it would result in the application site remaining in its current state. The present state of the study site is associated with vacant land with dumping present.

Infrastructure in the area will be left in its current state and no upgrades/ further provision of water and sewer reticulation systems and other services

will occur.

The social and economic benefits associated with the potential development (approved) will not be realized if the services installations and upgradings cannot go ahead.

6. IMPACT SUMMARY OF THE PROPOSAL OR PREFERRED ALTERNATIVE

For proposal:

Considering the proposed development occurs on a piece of land that has illegal dumping on it, where alien vegetation occurs and a development already has been approved, the proposed installation and upgrading of services will not have a major negative impact on the ecological surroundings.

Bio-Physical

- Despite a wetland bordering the development site, it is not anticipated that the development (installation and upgrading of services) will have any effect on the wetland should management measures in the EMPr be followed pertaining to stockpiling and storm water management.

Ecological

- No Red Listed flora or fauna species were recorded on site.
- Orange Listed plant species that was identified on the site could be incorporated into the open space areas on the approved development.
- Eradication of alien vegetation would improve conservation of indigenous flora species.

Institutional

- The proposed installation and upgrading of services for the approved township will result in the optimum utilisation of services.
- The proposed services installations and upgradings occurs within Zone 1 of the GPEMF i.e. identified as Urban Development Zone. The approved township is for an urban residential development and the proposed installation and upgrading services is for the purpose of the approved township.

Economical

- The installation and upgrading of services will create needed employment opportunities during construction phase to several skilled, semi-skilled, and un-skilled individuals.

Social

- The development will create employment opportunities during the construction phase.
- The services installations and upgradings will be for the already approved township on the study area.
- The developer will have to notify surrounding residents in the case of service disruptions.
- The R104/K22 will be upgraded.

Based on the biophysical, institutional, social, and economical characteristics, it is evident that the site is suitable for the proposed installation and upgrading of services.

The development will create numerous job opportunities during the construction phase which will be beneficial for the community, Local Authority and the Gauteng Province in general.

As already indicated in the report, most of the construction related activities could be mitigated to more acceptable levels and limited ecological impacts are anticipated. The proposed project (installation and upgrading of services) will in majority have an impact during the construction phase as impacts of services in its operational phase are uncommon.

As a result of the above mentioned information, we are of the opinion that the proposed development (only if planned, implemented, and managed correctly) will promote sustainable development and it will have a significant positive impact on the local area.

It is therefore requested that the development be allowed to proceed, and that the implementation of the Environmental Management Programme (**Appendix H**) be a condition of such an approval.

For alternative:

Not applicable

Having assessed the significance of impacts of the proposal and alternative(s), please provide an overall summary and reasons for selecting the proposal or preferred alternative.

The proposed installation and upgrading of services is for an approved township and therefore there were no alternatives assessed as the development is already approved and the alignment of all the services and upgrades have to work together with the township layout. The impacts of services are limited to the construction phase. The impacts of the installation and upgrading of services is on a small scale as the construction is of short term. Therefore, the proposed alignments are the preferred alignments and seen as the best option together with the approved development and the ecological environment. Motivation on the services alignments by the engineer have been added to Appendix L.

7. SPATIAL DEVELOPMENT TOOLS

Indicate the application of any spatial development tool protocols on the proposed development and the outcome thereof.

Spatial data was used to determine the agricultural potential, presence of rivers and wetlands and urban edge. Together with the Gauteng Conservation Plan (c-plan) data, the presence of ecological support areas and protected areas were also established.

8. RECOMMENDATION OF THE PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the Environmental Assessment Practitioner as bound by professional ethical standards and the code of conduct of EAPASA).

YES X	NO
------------------------	----

If "NO", indicate the aspects that require further assessment before a decision can be made (list the aspects that require further assessment):

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

Bokamoso believes both beneficial and adverse impacts were thoroughly assessed, and the needs and benefits for this project have been assessed to give the proposed services installations, rehabilitation works, cycling track and upgradings the go-ahead.

Thus, Bokamoso believes the proposed services installations and upgradings will have a significant long-term socio-economic beneficial impact on the subject property, especially due to the approved township. Considering all the above-mentioned information it is requested that this Basic Assessment be approved subject to the implementation of the mitigation measures contained in the Environmental Management Programme (**Appendix H**) and the other mitigation measures and recommendations mentioned below to achieve maximum advantage from beneficial impacts, and sufficient mitigation of adverse impacts. Should all the recommendations be adhered to it is foreseen that there would be no reason for this application not to be approved.

It is recommended that, based on the findings of the Basic Assessment Report and supplemental specialist information that:

- Should the proposed services installations and upgradings obtain the necessary environmental authorization, the Environmental Management Programme (EMPr) must be implemented for the construction and operational phases of the development. The EMPr, as attached to this document, should be made part of the contractual documents of the contractors;

- Mitigation measures, as set out in the EMPr, must be implemented during the construction and operational phases;
- External environmental monitoring must be conducted to ensure overall compliance with legislative requirements and the EMPr;
- Rehabilitation must be done correctly and on time, particularly in terms of erosion control and the prevention of exposed soils;
- If during construction any new evidence of archaeological sites or artefacts, paleontological fossils, graves or other heritage resources are found, the operations must be stopped and a qualified archaeologist or SAHRA must be contacted immediately for an assessment of the find;
- The safety and security of the people in the surrounding area are important and must be taken in to careful consideration during the construction phase;
- Local people are to be given employment preference;
- All recommendations made by the specialists in reports compiled for this development should be adhered to at all times;
- That GDARD approved the cycling track activity on the condition that the final alignment for the cycling track be submitted to GDARD and the CTMM land and environmental planning department for approval prior to the construction of such cycling track. The cycling track layout must also be supported by DWS;
- A dedicated EMPr and rehabilitation plan for the cycling track construction and operational phases must also be submitted to GDARD for approval prior to the commencement of construction with the cycling track. The plan must be compiled to prevent erosion and siltation; and
- If GDARD regards the inclusion of the cycling track as problematic at this stage, the applicant is willing to apply for an amendment at a later stage to include the cycling track. It is however requested that GDARD not keep the approval of the external services back because of the cycling track, because the installation and upgrading of the services and the SANRAL road area regarded as priority projects.

9. THE NEEDS AND DESIRABILITY OF THE PROPOSED DEVELOPMENT (as per notice 792 of 2012, or the updated version of this guideline)

The proposed development (external services) is situated approximately 2km to the south of Mamelodi. The external services upgradings will accommodate the already approved Riverwalk development (previously known as African Renaissance Proper) as well as other developments in the area.

10. THE PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED
(CONSIDER WHEN THE ACTIVITY IS EXPECTED TO BE CONCLUDED)

10 years plus

11. ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) (must include post construction monitoring requirements and when these will be concluded.)

If the EAP answers "Yes" to Point 7 above then an EMP is to be attached to this report as an Appendix

EMPr attached

YES
X

SECTION F: APPENDIXES

The following appendixes must be attached as appropriate (this list is inclusive, but not exhaustive):

It is required that if more than one item is enclosed that a table of contents is included in the appendix

Appendix A: Site plan(s) – *(must include a scaled layout plan of the proposed activities overlain on the site sensitivities indicating areas to be avoided including buffers)*

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Route position information – Not applicable

Appendix E: Public participation information

Appendix F: Water use license(s) authorisation, SAHRA information, service letters from municipalities, water supply information

Appendix G: Specialist reports

Appendix H: EMPr

Appendix I: Figures

Appendix J: Company Profile and CV

Appendix K: Letter to GDARD

Appendix L: Comment from Engineer

Appendix M: Town Planning Approval and Comments

Appendix N: DWS letter

Appendix O: S21 Water Use License – K22

CHECKLIST

To ensure that all information that the Department needs to be able to process this application, please check that:

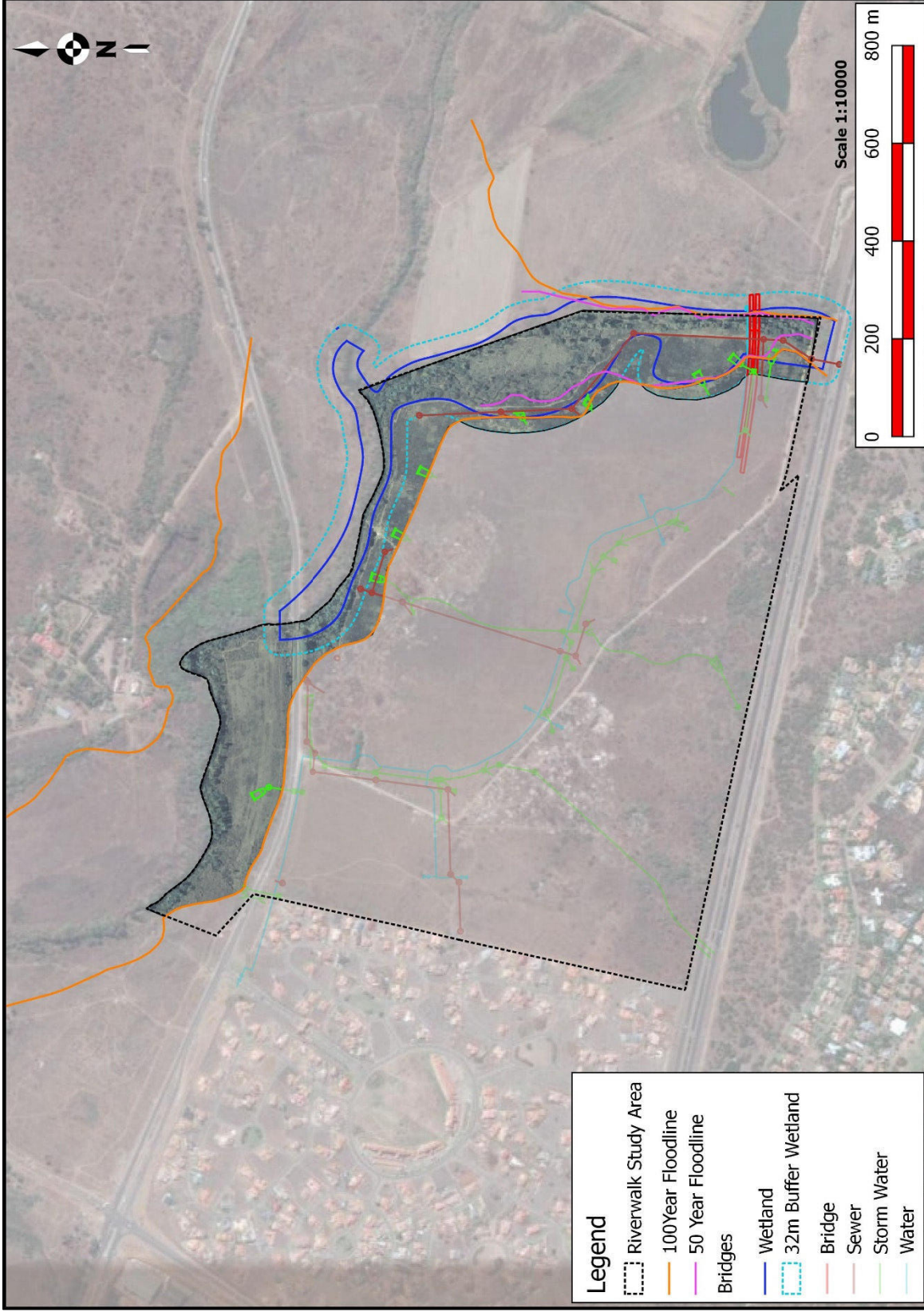
- Where requested, supporting documentation has been attached;
- All relevant sections of the form have been completed.

Site plan(s)

Appendix A

Riverwalk

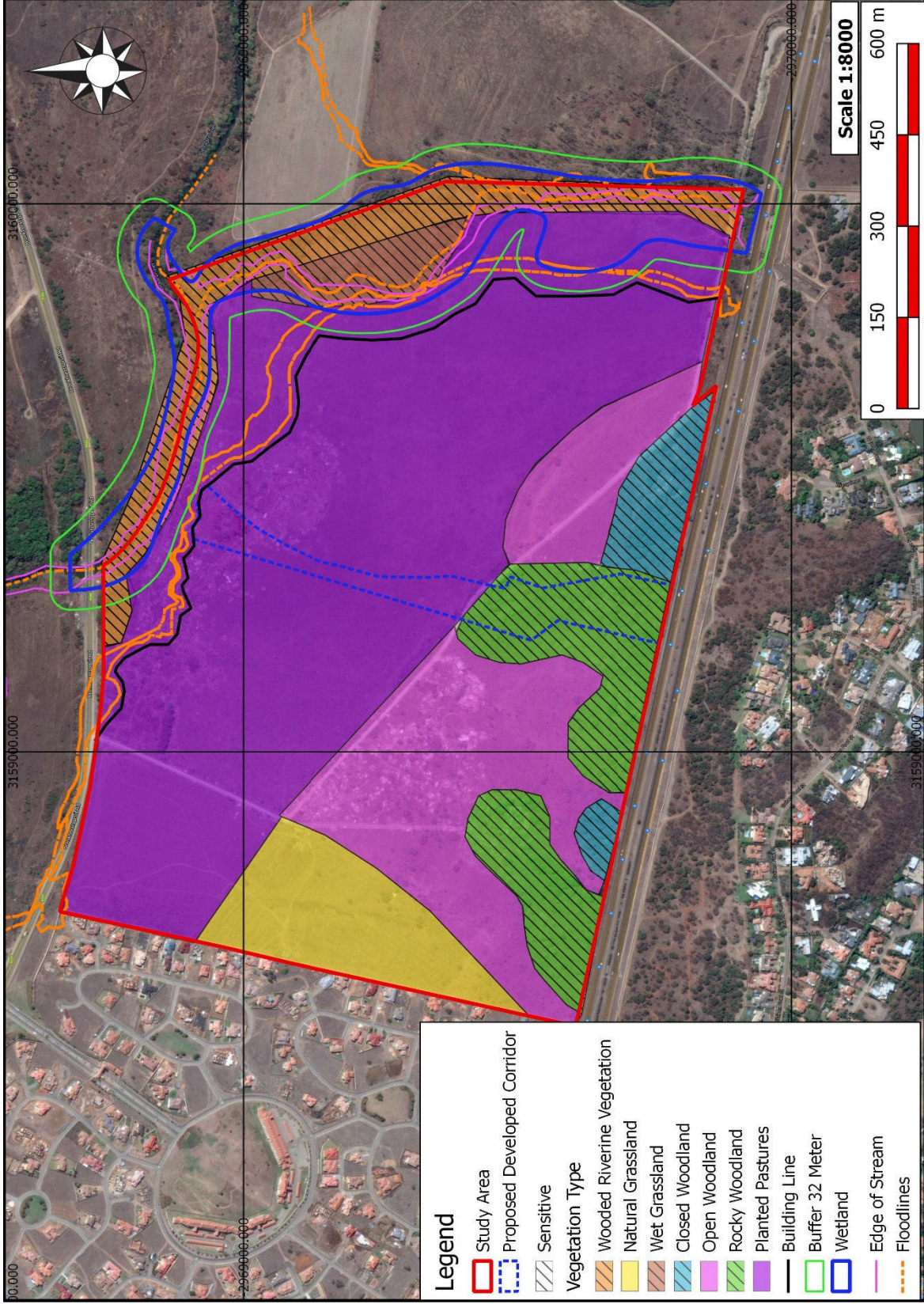
Bokamoso Environmental Consultants
Website: www.bokamoso.net
E-Mail: info@bokamoso.net



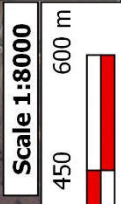
Projection – Transverse Mercator
Datum– Hartebeeshoek 1994
Reference Ellipsoid –WGS 1984
Central Meridian -29

Riverwalk Zwartkoppies Integrated Map

Bokamoso Environmental Consultants
E-Mail: sampie@bokamoso.net
corne@bokamoso.net

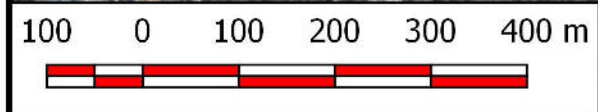
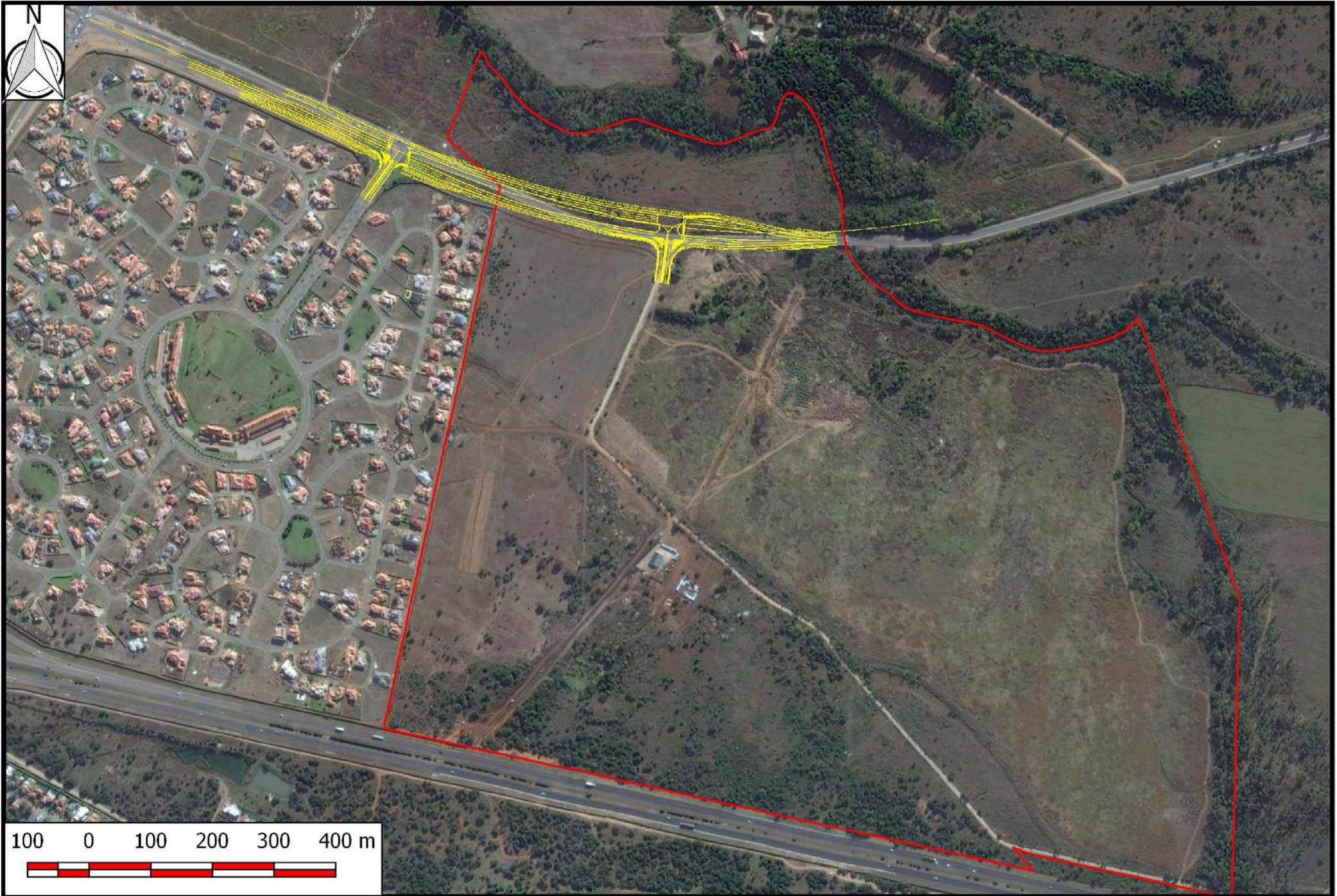


- Legend**
- Study Area
 - Proposed Developed Corridor
 - Sensitive
 - Vegetation Type**
 - Wooded Riverine Vegetation
 - Natural Grassland
 - Wet Grassland
 - Closed Woodland
 - Open Woodland
 - Rocky Woodland
 - Planted Pastures
 - Building Line
 - Buffer 32 Meter
 - Wetland
 - Edge of Stream
 - Floodlines

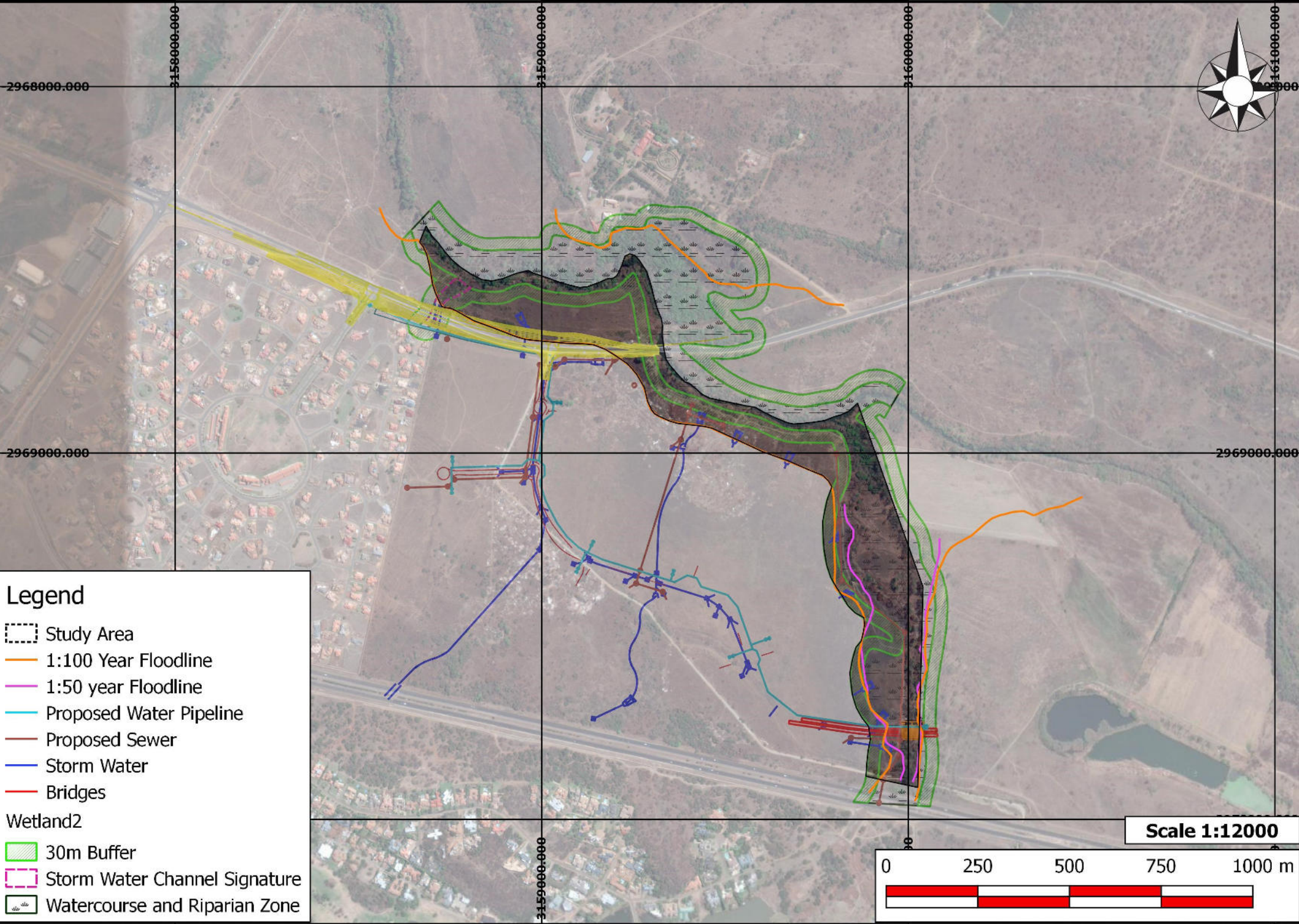


Projection – Transverse Mercator
Datum – Hartbeeshoek 1994
Reference Ellipsoid – WGS 1984
Central Meridian – 29











Road upgrades



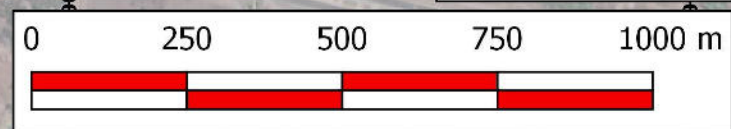
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Datum- Hartebeeshoek 1994
Reference Ellipsoid –WGS 1984
Central Meridian -29



Legend

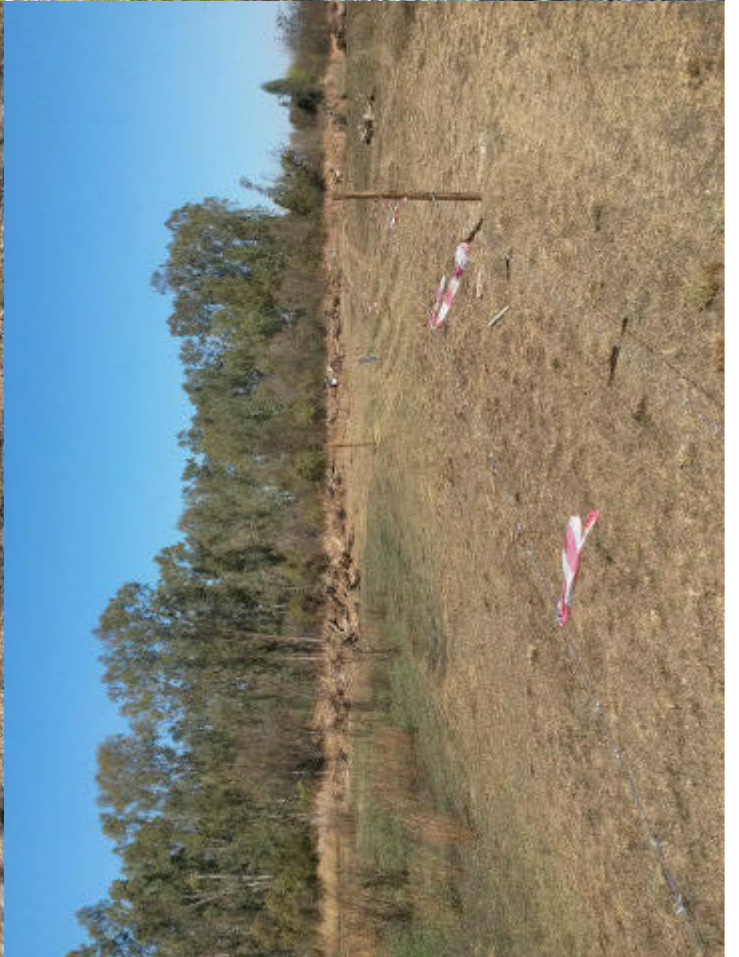
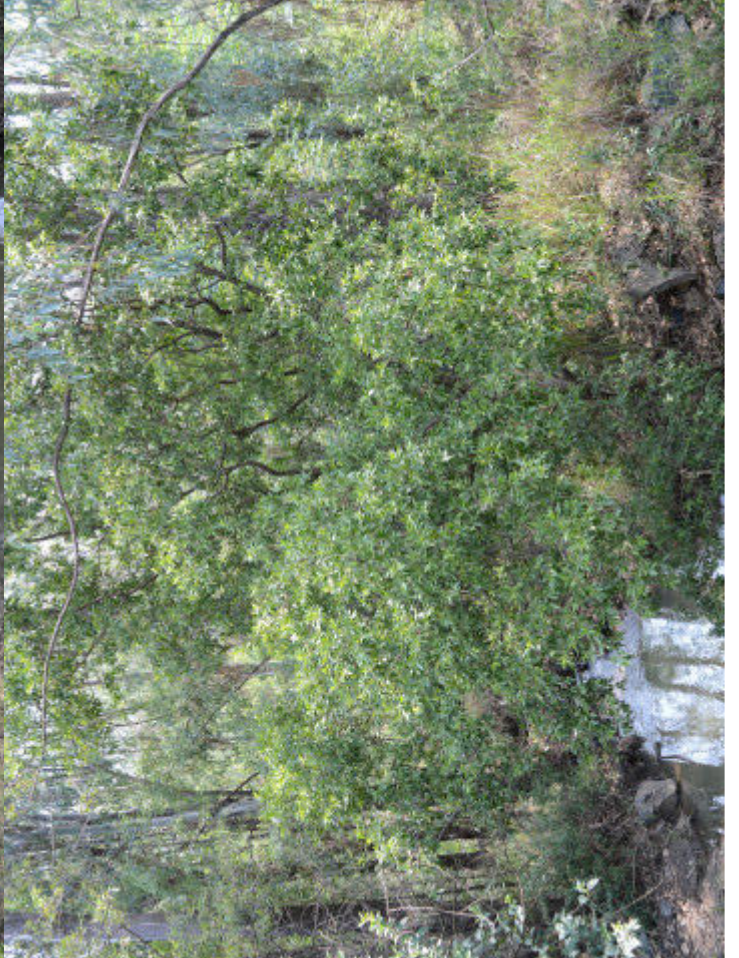
-  Study Area
-  1:100 Year Floodline
-  1:50 year Floodline
-  Proposed Water Pipeline
-  Proposed Sewer
-  Storm Water
-  Bridges
- Wetland2**
-  30m Buffer
-  Storm Water Channel Signature
-  Watercourse and Riparian Zone

Scale 1:12000



Photographs

Appendix B





Facility Illustration(s)

Appendix C

RIVERWALK BOULEVARD ROAD CENTRE LINE CO-ORDINATE LIST:

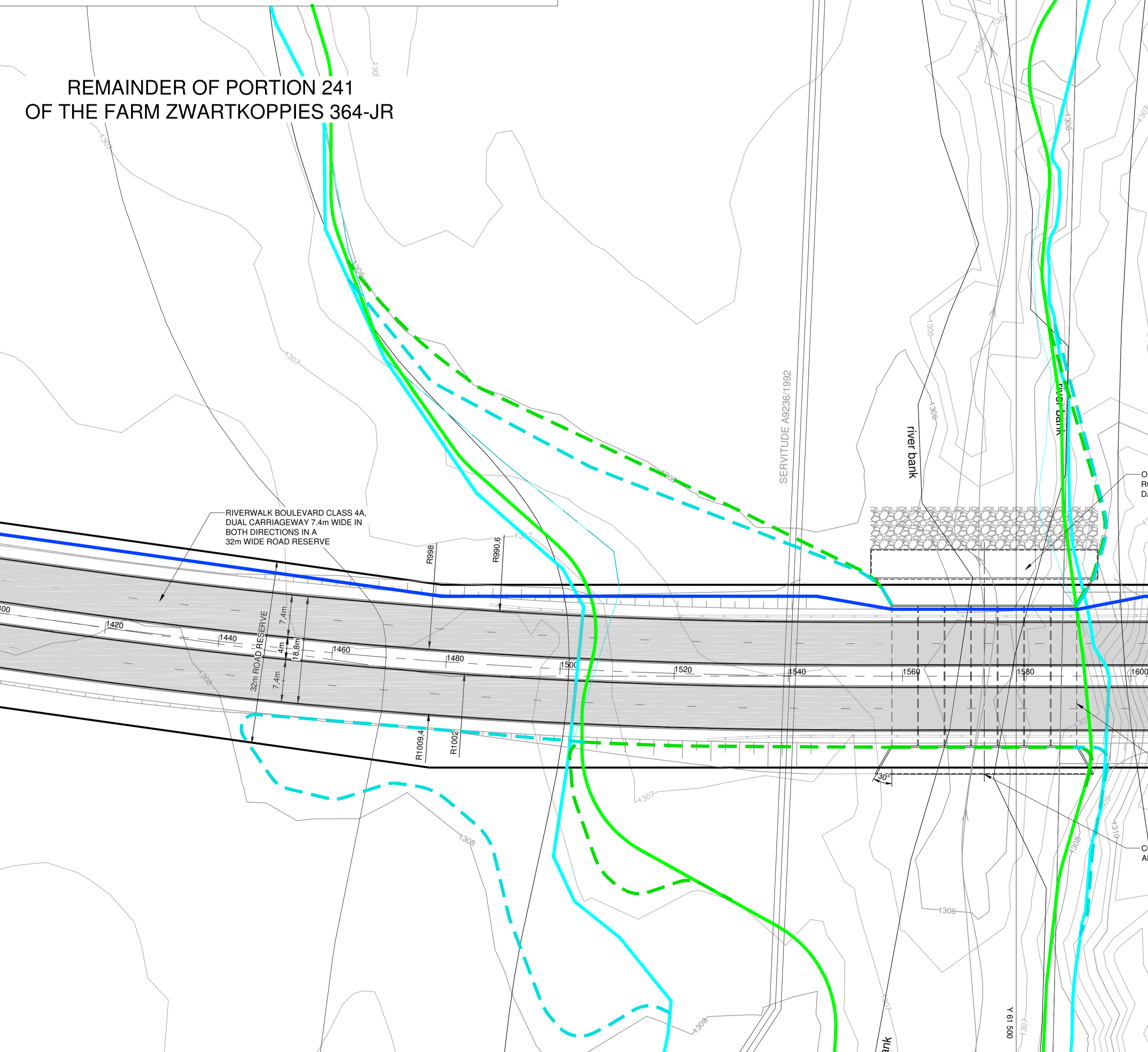
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BC1	280.002	7°14'58"	62442.691	2850052.935	CURVE1 RIGHT R = 250m TL = 210.365m
P11			63469.237	2850261.618	
EC1	629.760	287°05'28"	62268.162	2850323.442	Δ = -80°09'31" CL= 349.753m
BC2	898.948		62010.861	2850402.554	CURVE2 RIGHT R = 80m TL = 37.943m
P12			61974.594	2850413.705	
EC2	969.806	337°50'22"	61960.282	2850448.845	Δ = 50°44'54" CL= 70.858m
BC3	1149.972		61892.328	2850615.702	CURVE3 RIGHT R = 140m TL = 80.567m
P13			61861.932	2850670.317	
EC3	1296.186	278°00'01"	61782.149	2850701.530	Δ = -59°50'21" CL= 146.214m
BC4	1410.862		61668.890	2850717.490	CURVE4 LEFT R = 1000m TL = 69.929m
P14			61599.341	2850727.223	
EC4	1550.493	278°00'01"	61529.412	2850727.223	Δ = 8°00'01" CL= 139.631m
END	1916.563		61163.342	2850727.223	

RIVERWALK BOULEVARD

VERTICAL ALIGNMENT DATA - LEFT CARRIAGEWAY					
Peg dist.	Elev.	BVc	EVc	CL	Grade(%)
0.000	1302.653	0.000	0.000	0.00	-2.000
25.000	1302.153	25.000	25.000	0.00	-0.880
110.000	1301.405	30.000	190.000	160.00	1.740
470.000	1307.669	350.000	590.000	240.00	-0.769
660.000	1306.208	610.000	710.000	100.00	0.692
760.000	1306.900	710.000	810.000	100.00	-0.723
890.000	1305.960	820.000	960.000	140.00	1.261
1167.133	1309.454	1067.133	1267.133	200.00	-0.899
1440.000	1307.000	1300.000	1580.000	280.00	0.930
1626.573	1308.736	1586.573	1666.573	80.00	1.410
1916.563	1312.825	1916.563	1916.563	0.00	0.000

RIVERWALK BOULEVARD

VERTICAL ALIGNMENT DATA - RIGHT CARRIAGEWAY					
Peg dist.	Elev.	BVc	EVc	CL	Grade(%)
0.000	1302.653	0.000	0.000	0.00	-2.000
25.000	1302.153	25.000	25.000	0.00	-0.880
110.000	1301.405	30.000	190.000	160.00	1.740
470.000	1307.669	350.000	590.000	240.00	-0.769
660.000	1306.208	610.000	710.000	100.00	0.692
760.000	1306.900	710.000	810.000	100.00	-0.723
890.000	1305.960	820.000	960.000	140.00	1.261
1167.133	1309.454	1067.133	1267.133	200.00	-0.899
1440.000	1307.000	1300.000	1580.000	280.00	0.930
1626.573	1308.736	1586.573	1666.573	80.00	1.410
1916.563	1312.825	1916.563	1916.563	0.00	0.000

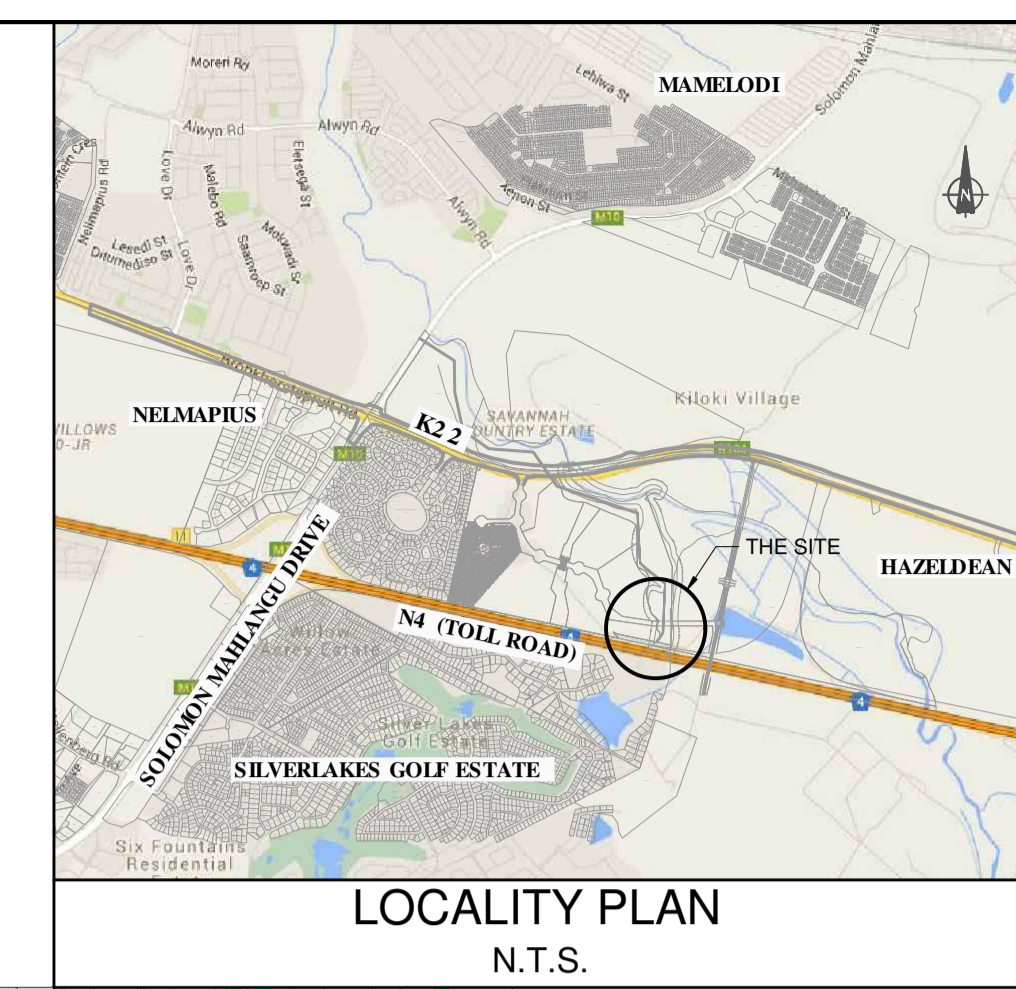


REMAINDER OF PORTION 241 OF THE FARM ZWARTKOPPIES 364-JR

- HYDRAULIC DATA:**
- DESIGN RECURRENCE PERIOD: 50 YEAR
 - DESIGN FLOOD: 107m³/s
 - AVAILABLE HEADWATER (Hw): 1.7m
 - CULVERT DESIGN: 74000 x 1500mm BC
 - Hw/D: 1.13 + 300mm FREEBOARD
 - DESIGN FLOW PER OPENING: 15.3m³/s
 - CONTROL: INLET CONTROL

BENCHMARKS WGS 1984 Lo.29

Y	X	Z	Notes
BM1	63212.417	2849497.373	1305.69 10mm iron peg
BM2	63185.309	2849507.493	1305.55 10mm iron peg
BM3	62413.985	2849811.938	1300.56 10mm iron peg
BM4	62394.467	2849809.692	1300.74 10mm iron peg



- NOTES AND SPECIFICATIONS**
- ALL MATERIAL AND WORKMANSHIP MUST COMPLY WITH THE REQUIREMENTS OF THE LATEST RELEVANT SABS SPECIFICATION.
 - ALL DIMENSIONS ARE IN METERS. (UNLESS OTHERWISE SPECIFIED)
 - DO NOT SCALE FROM THESE DRAWINGS.
 - ALL DIMENSIONS MUST BE CHECKED AND APPROVED ON SITE.
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 - THESE DRAWINGS MUST BE READ IN CONJUNCTION WITH THE ARCHITECTS DRAWINGS. (IF APPLICABLE)
 - HIS DRAWING MUST BE READ IN CONJUNCTION WITH THE STANDARD SPECIFICATIONS FOR MUNICIPAL CIVIL ENGINEERING WORKS, SERIES 4.
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 - ROADS: TRAFFIC CONTROL MUST COMPLY WITH THE REQUIREMENTS OF THE AFRICAN ROAD TRAFFIC SIGNS MANUAL (THIRD EDITION).

LEGEND:

- NEW ROADWAYS
- EXISTING FLOODLINE 1:100
- EXISTING FLOODLINE 1:50
- PREDICTED NEW FLOODLINE 1:100
- PREDICTED NEW FLOODLINE 1:50
- FUTURE MUNICIPAL WATER PIPE IN SIDE FILL
- FIG.7 KERB + 150mm CONCRETE CHANNEL

NOTE:
FOR LONG SECTION OF ROADWAY REFER TO C2142-M950-294

DEVELOPER DETAIL
Balwin PROPERTIES

ARCHITECTS DETAIL
VTC Architecture
www.vtcgroup.biz

AMENDMENTS

Nr.	DATE	APPROVED	DESCRIPTION	PAR.
A	23-05-2018		CONCEPT DRAWING	

DESIGNED
J.P. WELLMAN

DRAWN
R. WILLIERS

DESIGN CHECKED BY
W. STANDER

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, MAY 2016

INSPECTOR OF WORKS (CITY OF TSHWANE):

CONSULTANT DETAIL

CIVIL CONCEPTS
CONSULTING CIVIL AND STRUCTURAL ENGINEERS
P.O. BOX 36148 Menlo Park 0102
Tel: (012) 460-0008
Fax: (012) 460-0005
E-Mail: mail@civilconcepts.co.za

CITY OF TSHWANE
TRANSPORT DEPARTMENT

Mr. P. Letlorkane, STRATEGIC EXECUTIVE DIRECTOR
Ms. L. V. Kegakihwe-Piki, EXECUTIVE DIRECTOR

P.O. BOX 1409, PRETORIA 0001

RIVERWALK PORTION 241 OF THE FARM ZWARTKOPPIES No. 364-JR

RIVERWALK BOULEVARD BRIDGE LAYOUT OPTION 1

CONTRACT No.: C2142

DATE: MAY 2016

SCALE: 1:500

ORIGINAL PAPER SIZE: A1

DRAWING No.: C2142-M950-296

SHEET No.: 1

REVISION

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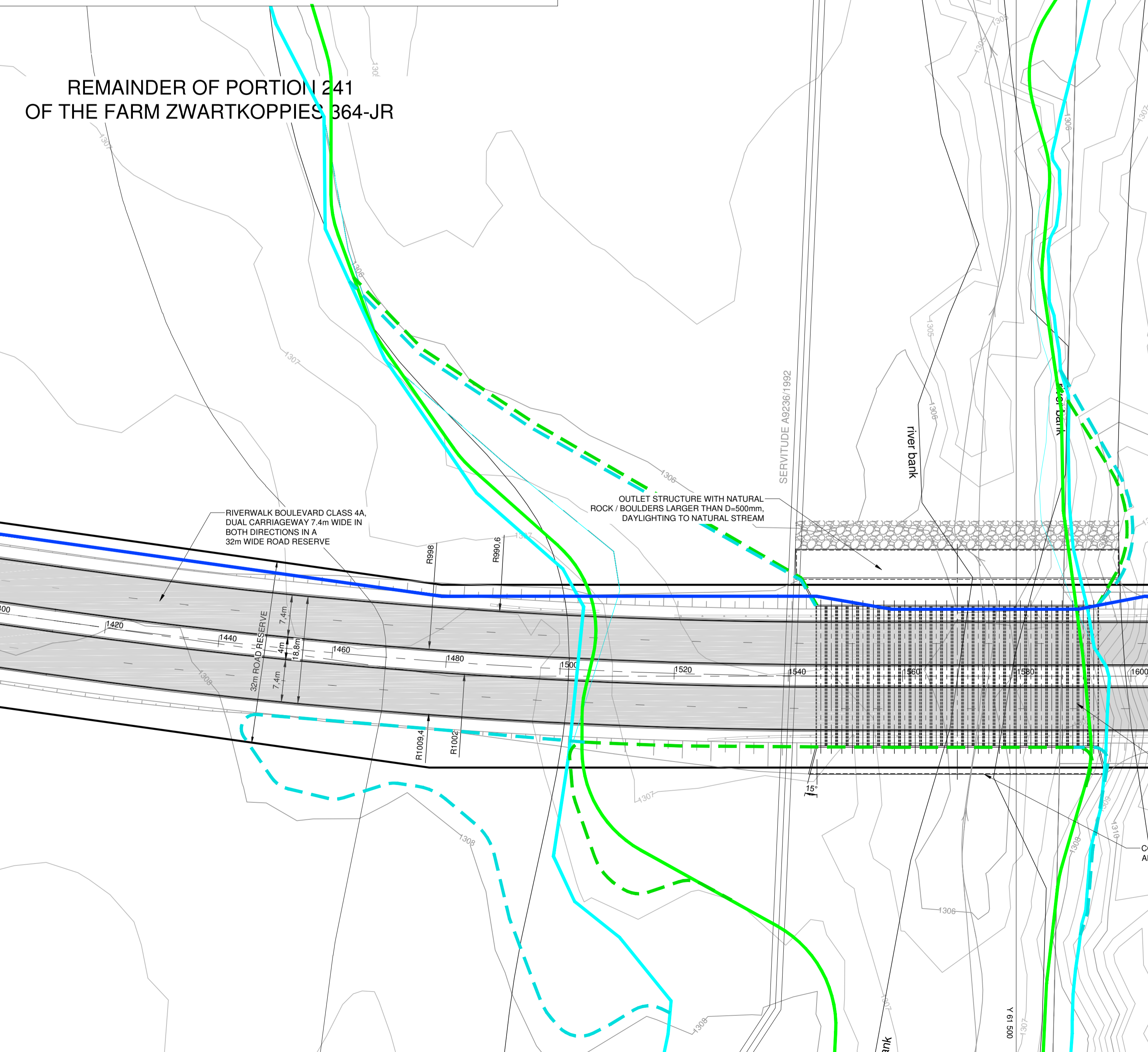
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RIVERWALK BOULEVARD

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760.000	1306.900	710.000	810.000	100.000	-0.723
890.000	1305.960	820.000	960.000	140.000	1.261
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RIVERWALK BOULEVARD

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Peg dist.	Elev.	BVc	EVc	CL	Grade(%)
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1167.133	1309.454	1067.133	1267.133	200.000	-0.899
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1626.573	1308.736	1586.573	1666.573	80.000	1.410
1916.563	1312.825	1916.563	1916.563	0.000	0.000

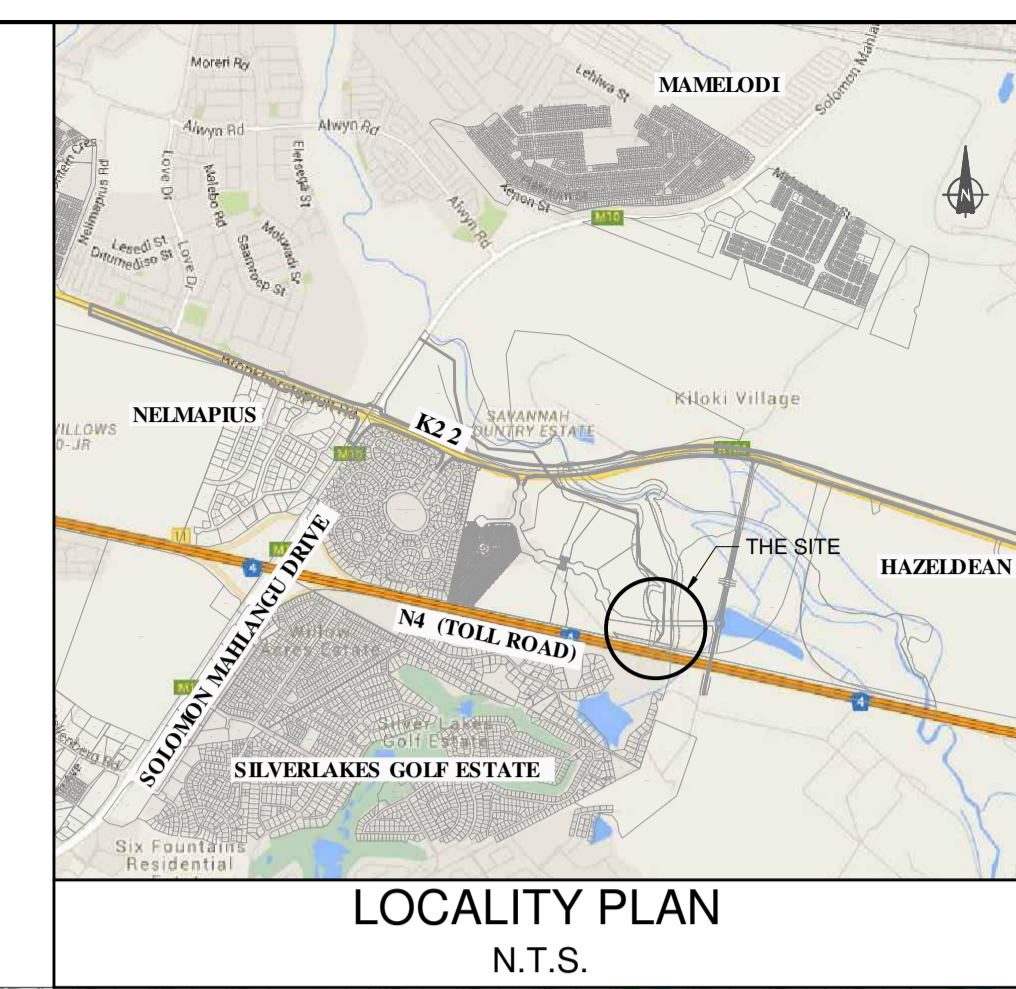


REMAINDER OF PORTION 241 OF THE FARM ZWARTKOPPIES 364-JR

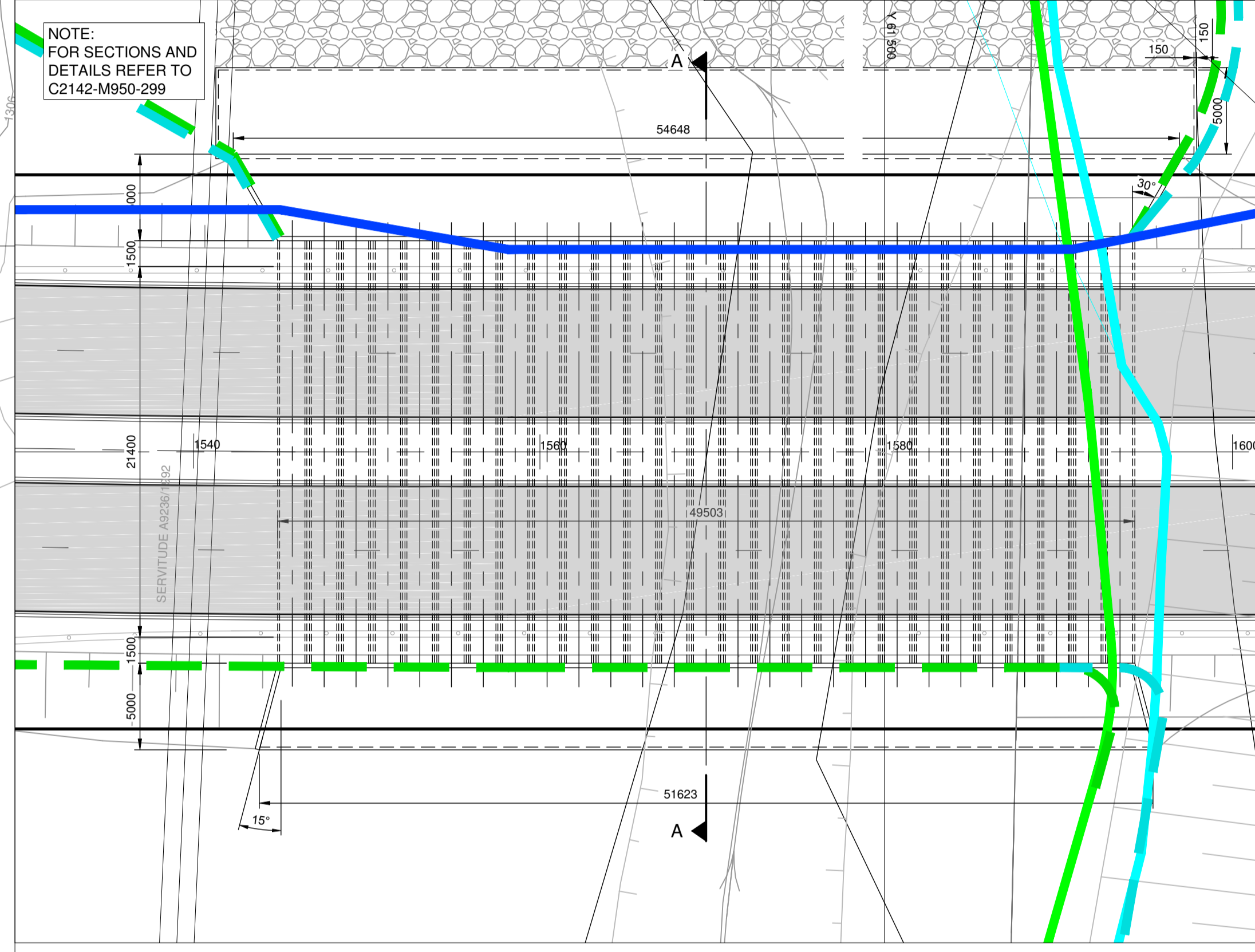
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 - CULVERT DESIGN: 27 x 1500mm PC
 - Hw/D: 1.13 + 300mm FREEBOARD
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BENCHMARKS WGS 1984 Lo.29

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BM3	62413.985	2849811.938	1300.56	10mm iron peg
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 - EXISTING FLOODLINE 1:100
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 - PREDICTED NEW FLOODLINE 1:100
 - PREDICTED NEW FLOODLINE 1:50
 - FUTURE MUNICIPAL WATER PIPE IN SIDE FILL
 - FIG.7 KERB + 150mm CONCRETE CHANNEL
- NOTE:** FOR LONG SECTION OF ROADWAY REFER TO C2142-M950-295



LAYOUT AND DIMENSIONS SCALE 1:250

DEVELOPER DETAIL
Balwin PROPERTIES

ARCHITECTS DETAIL
VTC Architecture
www.vtcgroup.biz

AMENDMENTS

Nr.	DATE	APPROVED	DESCRIPTION	PAR.
A	23-05-2016		CONCEPT DRAWING	

DESIGNED J.P. WELLMAN
DRAWN R. WILLIERS
DESIGN CHECKED BY W. STANDER
INFRASTRUCTURE TECHNICAL INFORMATION MANAGEMENT D.J. CHALMERS

PROJECT STATUS

CONCEPT DRAWING: TENDER DRAWING: APPROVED FOR CONSTRUCTION: AS BUILT DRAWING:

PROJECT ENGINEER (CONSULTANT): W. STANDER
INITIALS AND SURNAME: W. STANDER
SIGNATURE AND P. No.: 20060017
DATE: MAY 2016

CONSULTANT DETAIL

CIVIL CONCEPTS
CONSULTING CIVIL AND STRUCTURAL ENGINEERS
P.O. BOX 36148 Menlo Park 0102
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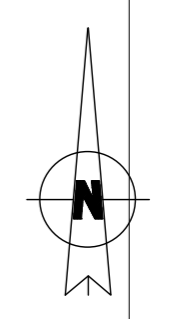
RIVERWALK PORTION 241 OF THE FARM ZWARTKOPPIES No. 364-JR

RIVERWALK BOULEVARD BRIDGE LAYOUT OPTION 2

CONTRACT No.: PROJECT No.: C2142

DATE: MAY 2016 SCALE: 1:500 ORIGINAL PAPER SIZE: A1

DRAWING NO.: C2142-M950-297 SHEET NO.: REVISION



NOTES AND SPECIFICATIONS

1. ALL BELLMOUTH RADI TO BE 10m UNLESS OTHERWISE SHOWN.
2. ALL ROADS TO BE PROVIDED WITH KERBING/EDGING ACCORDING TO TYPICAL DETAILS AND LEGEND BELOW.
3. P.I. CO-ORDINATES AND RADI INDICATED ARE ON THE CENTERLINE OF THE ROAD
4. ROAD CLASSIFICATION:
 7.4m ROAD: ROAD CLASS 4, CATEGORY UB, CLASSIFICATION E1
 5.9m ROAD: ROAD CLASS 5B, CATEGORY UC, CLASSIFICATION E3
 4.5m ROAD: ROAD CLASS 5B, CATEGORY UC, CLASSIFICATION E3
5. ALL MATERIAL AND WORKMANSHIP MUST COMPLY WITH THE REQUIREMENTS OF THE LATEST RELEVANT SABS SPECIFICATION.
6. ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SPECIFIED.
7. DO NOT SCALE FROM THESE DRAWINGS.
8. ALL DIMENSIONS MUST BE CHECKED AND APPROVED ON SITE.
9. ALL CONSTRUCTION TO BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR MUNICIPAL CIVIL ENGINEERING WORKS, THIRD EDITION 2005 AND THE STANDARD CIVIL DETAIL DRAWINGS.
10. THESE DRAWINGS MUST BE READ IN CONJUNCTION WITH THE ARCHITECTS DRAWINGS, IF APPLICABLE.
11. THIS DRAWING MUST BE READ IN CONJUNCTION WITH THE STANDARD SPECIFICATIONS FOR MUNICIPAL CIVIL ENGINEERING WORKS, SERIES 4.
12. THE SIGNATURE OR INITIALS ON THIS DRAWING, OF ANY MANAGER OF THE TRANSPORT AND ROADS DEPARTMENT, BY 20 MAY 2016, CONFIRMS ANY RESPONSIBILITY WHICH SOLELY FROM THE CONSULTANT.
13. THE CONSULTANT REMAINS RESPONSIBLE TO ENSURE THAT ALL THE GUIDELINES, STANDARD DRAWINGS, STANDARDS AND SPECIFICATIONS OF THE TRANSPORT AND ROADS DEPARTMENT HAVE BEEN MET AND ARE COMPLIED WITH.
14. ALL LEVELS OF EXISTING SERVICES ARE TO BE CHECKED AND VERIFIED ON SITE AND SUBMITTED TO THE ENGINEER PRIOR TO THE COMMENCEMENT OF THE CONSTRUCTION.

- LEGEND:
- PROPOSED ROAD UPGRADES
 - FLOODLINE 1:100 WITH ROAD AND BERM
 - NEW STORMWATER LINE
 - NEW STORMWATER OUTLET WITH SEDIMENT AND LITTER TRAP
 - NEW STORMWATER GRID INLET
 - NEW STORMWATER KERB INLET

DEVELOPER DETAIL	ARCHITECTS DETAIL
	VTC Architecture www.vtcgroup.biz

NO.	DATE	APPROVED	DESCRIPTION	PAR.

DESIGNED BY W. STANDER	DATE MAY 2016	DRAWN BY R. WILMERS
DESIGN CHECKED BY W. STANDER	DATE MAY 2016	INFRASTRUCTURE TECHNICAL INFORMATION MANAGER D.J. CHALMERS

PROJECT STATUS			
DESIGNED	APPROVED	CONSTRUCTION	AS BUILT
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PROJECT ENGINEER / CONSULTANT W. STANDER	PROJECT NO. 20060017	DATE MAY 2016	
DRAWING NO. C2142-000-005	SCALE AS SHOWN	DATE	

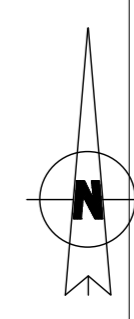
CONSULTANT DETAIL	
	CONSULTING CIVIL AND STRUCTURAL ENGINEERS P.O. BOX 36148 Menlo Park 0102 Tel: (012) 460-0008 Fax: (012) 460-0005 E-Mail: mail@civilconcepts.co.za

CITY OF TSHWANE TRANSPORT DEPARTMENT	
MR. P. LEBESKOP STRATEGIC EXECUTIVE DIRECTOR P.O. BOX 1409 PRETORIA 0001	MR. L. V. KOGELER EXECUTIVE DIRECTOR P.O. BOX 1409 PRETORIA 0001
DRAWING APPROVED BY EXECUTIVE DIRECTOR MR. L. V. KOGELER PHE	

LOCATION OF PROJECT	
RIVERWALK PORTION 241 OF THE FARM ZWARTKOPPIES No. 364-JR	
DESCRIPTION OF PROJECT	
MASTER LAYOUT - STORMWATER	

CONTRACT NO. C2142	PROJECT NO. C2142
DATE MAY 2016	SCALE 1:10000
DRAWING NO. C2142-000-005	ORIGINAL PAPER SIZE A0
SHEET NO. 1	REVISION





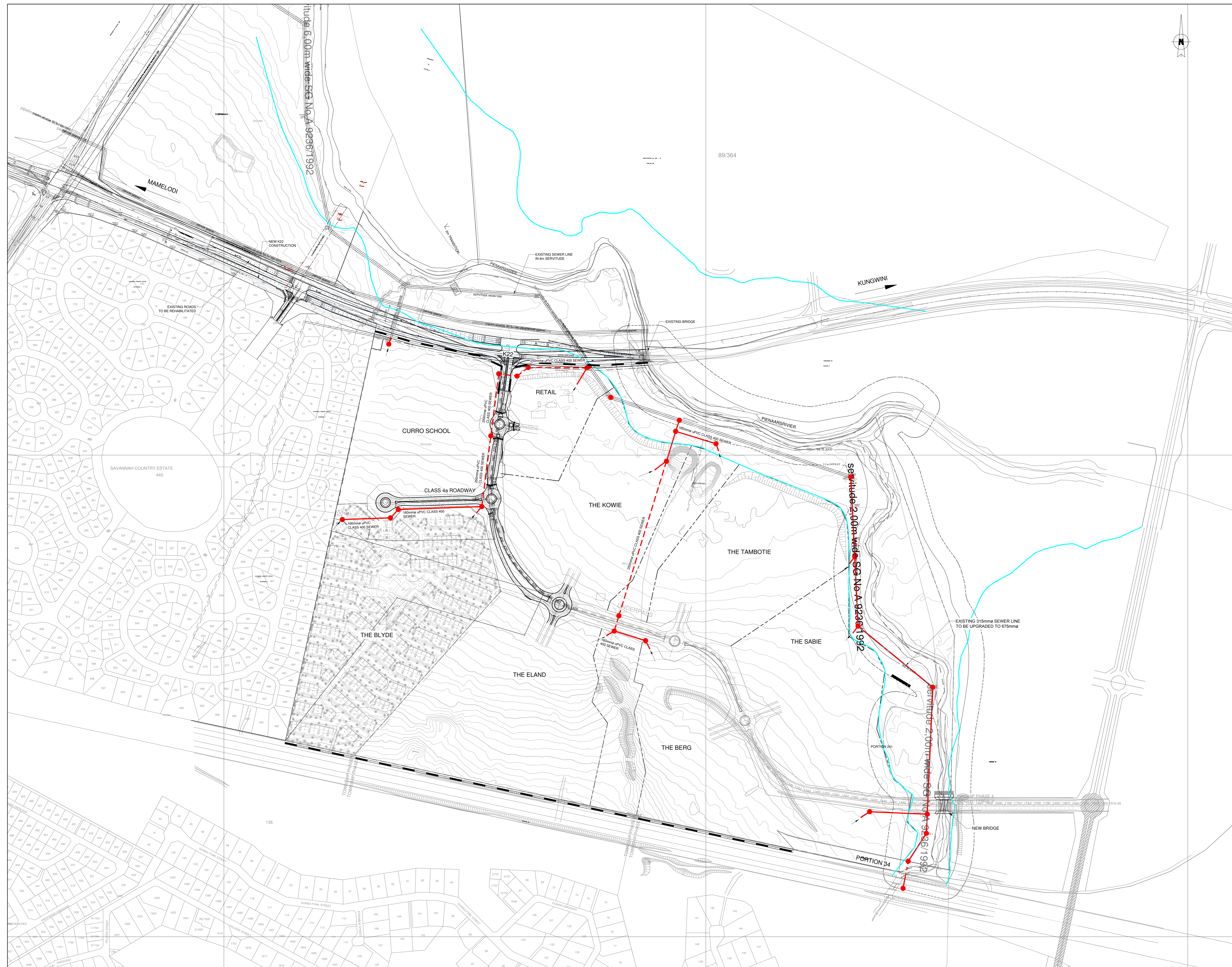
NOTES AND SPECIFICATIONS

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2. ALL ROADS TO BE PROVIDED WITH KERBING/EDGING ACCORDING TO TYPICAL DETAILS AND LEGEND BELOW.
3. P.I. CO-ORDINATES AND RADI INDICATED ARE ON THE CENTERLINE OF THE ROAD
4. ROAD CLASSIFICATION:

7.4m ROAD:	ROAD CLASS 4	CATEGORY UC	CLASSIFICATION E1
5.8m ROAD:	ROAD CLASS 5B	CATEGORY UC	CLASSIFICATION E2
5.3m ROAD:	ROAD CLASS 5B	CATEGORY UC	CLASSIFICATION E3
4.5m ROAD:	ROAD CLASS 5B	CATEGORY UC	CLASSIFICATION E4
5. ALL MATERIAL AND WORKMANSHIP MUST COMPLY WITH THE REQUIREMENTS OF THE LATEST RELEVANT SABS SPECIFICATION.
6. ALL DIMENSIONS ARE IN METERS, (UNLESS OTHERWISE SPECIFIED)
7. DO NOT SCALE FROM THESE DRAWINGS.
8. ALL DIMENSIONS MUST BE CHECKED AND APPROVED ON SITE.
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11. THIS DRAWING MUST BE READ IN CONJUNCTION WITH THE STANDARD SPECIFICATIONS FOR MUNICIPAL CIVIL ENGINEERING WORKS, SERIES 4
12. THE SIGNATURE OR INITIALS ON THIS DRAWING, OF ANY MANAGER OF THE RESPONDENT AND HIS/HER DEPARTMENT, BY HIS/HER DEPARTMENT, ANY RESPONSIBILITY WILL SOLELY BE FROM THE CONSULTANT.
13. THE CONSULTANT REMAINS RESPONSIBLE TO ENSURE THAT ALL THE GUIDELINES, STANDARD DRAWINGS, STANDARDS AND SPECIFICATIONS OF THE TRANSPORT AND ROADS DEPARTMENT HAVE BEEN MET AND ARE COMPLIED WITH.
14. ALL LEVELS OF EXISTING SERVICES ARE TO BE CHECKED AND VERIFIED ON SITE AND SUBMITTED TO THE ENGINEER PRIOR TO THE COMMENCEMENT OF THE CONSTRUCTION.

LEGEND:

- PROPOSED ROAD UPGRADES
- FLOODLINE 1:100 WITH ROAD AND BERM
- EXISTING SEWER LINE
- NEW 160mm uPVC CLASS 400 SEWER LINE
- NEW 250mm uPVC CLASS 400 SEWER LINE
- EXISTING 315mm TO BE UPGRADED TO 675mm
- NEW SEWER MANHOLE



DEVELOPER DETAIL 	ARCHITECTS DETAIL
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NO.	DATE	APPROVED	DESCRIPTION	PAR.

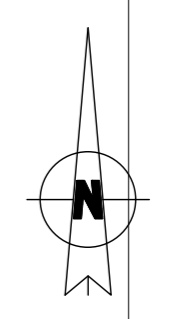
DESIGNED BY W. STANDER	DATE MAY 2016	DRAWN BY R. WILMERS
DESIGN CHECKED BY W. STANDER	DATE MAY 2016	INFRASTRUCTURE TECHNICAL INFORMATION MANAGER D.J. CHALMERS

PROJECT STATUS	
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PROJECT ENGINEER / CONSULTANT W. STANDER	PROJECT NO. 20060017
DATE MAY 2016	DATE MAY 2016

CONSULTANT DETAIL 	CONSULTING CIVIL AND STRUCTURAL ENGINEERS P.O. BOX 36148 Menlo Park 0102 Tel: (012) 460-0008 Fax: (012) 460-0005 E-Mail: mail@civilconcepts.co.za
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CITY OF TSHWANE TRANSPORT DEPARTMENT	
M. P. LEBESORE STRATEGIC EXECUTIVE DIRECTOR P.O. BOX 1409 PRETORIA 0001	M. L. V. KOGELER-PM EXECUTIVE DIRECTOR P.O. BOX 1409 PRETORIA 0001
DRAWING APPROVED BY EXECUTIVE DIRECTOR M. L. V. Kogelers-PM	

LOCATION OF PROJECT RIVERWALK PORTION 241 OF THE FARM ZWARTKOPPIES No. 364-JR	
DESCRIPTION OF PROJECT MASTER LAYOUT - SEWER	
CONTRACT NO. C2142	PROJECT NO. C2142
DATE MAY 2016	SCALE 1:10000
DRAWING NO. C2142-000-006	ORIGINAL PAPER SIZE A0
SHEET NO.	REVISION

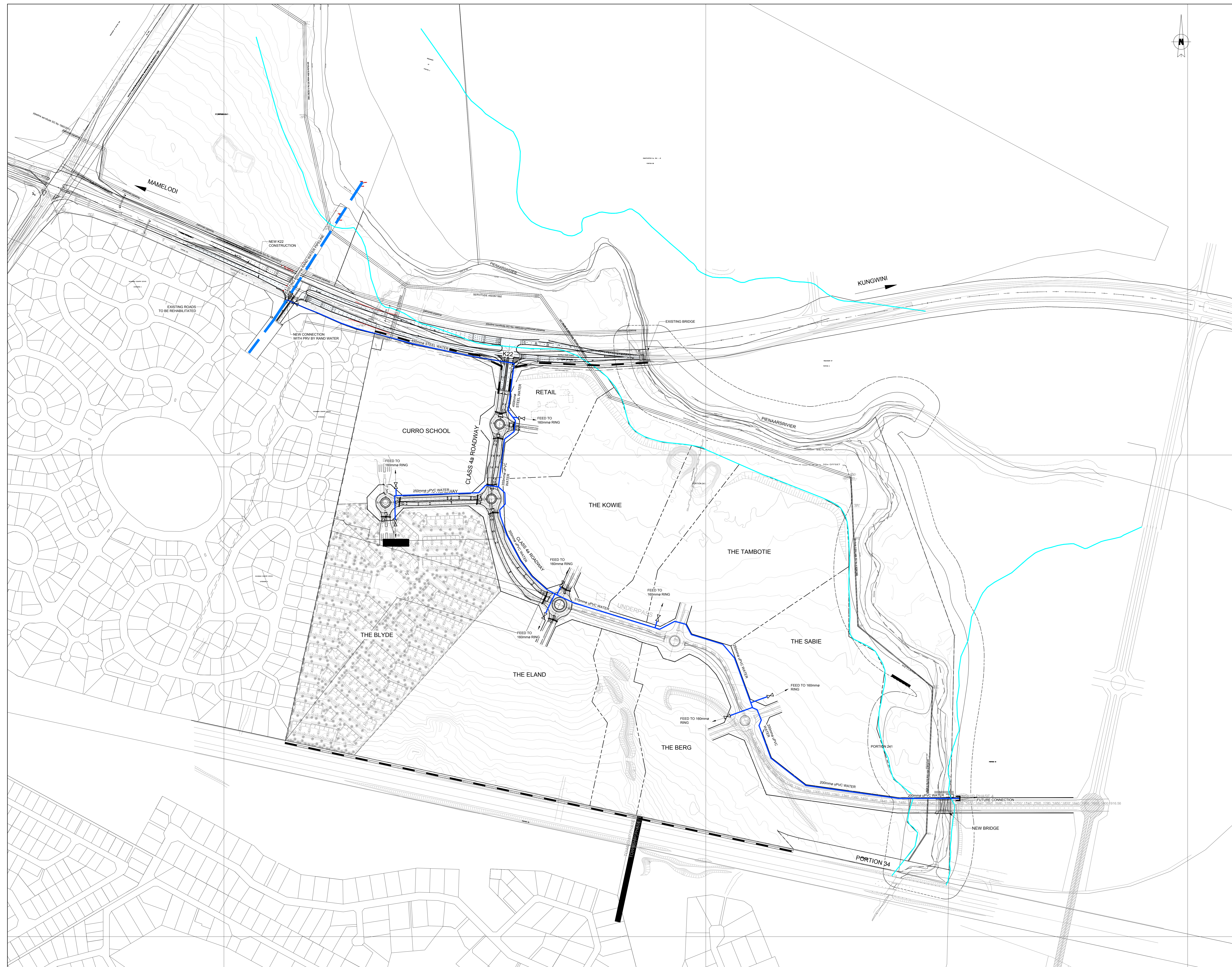


NOTES AND SPECIFICATIONS

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 4.5m ROAD: ROAD CLASS 5B, CATEGORY UC, CLASSIFICATION E2
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12. THE SIGNATURE OR INITIALS ON THIS DRAWING, OF ANY MANAGER OF THE TRANSPORT AND ROADS DEPARTMENT, BY NO MEANS ASSUMES ANY RESPONSIBILITY WHATSOEVER FROM THE CONSULTANT.
13. THE CONSULTANT REMAINS RESPONSIBLE TO ENSURE THAT ALL THE GUIDELINES, STANDARD DRAWINGS, STANDARDS AND SPECIFICATIONS OF THE TRANSPORT AND ROADS DEPARTMENT HAVE BEEN MET AND ARE COMPLIED WITH.
14. ALL LEVELS OF EXISTING SERVICES ARE TO BE CHECKED AND VERIFIED ON SITE AND SUBMITTED TO THE ENGINEER PRIOR TO THE COMMENCEMENT OF THE CONSTRUCTION.

LEGEND:

- PROPOSED ROAD UPGRADES
- FLOODLINE 1:100 WITH ROAD AND BERM
- EXISTING WATER LINE
- NEW 200mm uPVC WATER LINE
- NEW 250mm uPVC WATER LINE
- NEW 315mm uPVC WATER LINE
- NEW 355mm uPVC WATER LINE
- NEW 450mm uPVC WATER LINE
- NEW PRV WATER VALVE
- NEW END CAP



DEVELOPER DETAIL		ARCHITECTS DETAIL	
Balwin PROPERTIES		VTC Architecture www.vtcgroup.biz	
AMENDMENTS			
NO.	DATE	APPROVED	DESCRIPTION
DESIGNED BY	DATE	DRAWN BY	DATE
W. STANDER	MAY 2016	R. WILLERS	
DESIGN CHECKED BY	DATE	INFRASTRUCTURE TECHNICAL INFORMATION MANAGER	DATE
W. STANDER	MAY 2016	D.J. CHALMERS	
PROJECT STATUS			
PROJECT ENGINEER / CONSULTANT	DATE	PROJECT NO.	DATE
W. STANDER	MAY 2016	20000017	MAY 2016
DRAWING NO.	DATE	SIGNATURE AND P. NO.	DATE
CONSULTANT DETAIL			
CONSULTING CIVIL AND STRUCTURAL ENGINEERS P.O. BOX 36148 Menlo Park 0102 Tel: (012) 400-0008 Fax: (012) 400-0005 E-Mail: mail@civiconcepts.co.za			
CITY OF TSHWANE			
TRANSPORT DEPARTMENT			
MR. P. LEBESKINE STRATEGIC EXECUTIVE DIRECTOR	MR. L. V. KOGELHORN-PIE EXECUTIVE DIRECTOR		
P.O. BOX 400 PRETORIA 0001	P.O. BOX 1400 PRETORIA 0001		
DRAWING APPROVED BY EXECUTIVE DIRECTOR MR. L. V. KOGELHORN-PIE			
SIGNATURE: _____ DATE: _____			
RIVERWALK			
PORTION 241 OF THE FARM ZWARTKOPPIES No. 364-JR			
MASTER LAYOUT - WATER			
CONTRACT NO.:	PROJECT NO.:		
	C2142		
DATE:	SCALE:	ORIGINAL PAPER SIZE:	
MAY 2016	1:10000	A0	
DRAWING NO.:	SHEET NO.:	REVISION:	
C2142-000-007			