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ENVIRONMENTAL IMPACT ASSESSMENT DRAFT BASIC ASSESSMENT REPORT

AUTUMN LEAF SHOPPING MALL PROJECT
DATE 23 AUGUST 2016

Executive Summary

Compiled by:

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1 INTRODUCTION

Akani Properties Pty (Ltd) (the applicant) appointed **Setala Environmental** as the independent Environmental Assessment Practitioner (EAP) to undertake the Environmental Impact Assessment (EIA) for the proposed Autumn Leaf Mall and associated infrastructure in Zeerust.

Zeerust is an established commercial town and a popular retail destination with shoppers traveling to the town from surrounding areas, including Botswana. Currently Zeerust only has one formal retail shopping centre, managed by Akani Properties, which is oversubscribed. The proposed Autumn Leaf Mall will be owned and managed by Akani Properties. The proposed project is located approximately 2km east of the Zeerust CBD, and falls within the Ramotshere Moiloa Local Municipality, North West Province.

The proposed Autumn Leaf Mall is the first phase of a proposed Zeerust Multi-Purpose Development. The erf size for the complete development is approximately 28 hectares in extent. The proposed Autumn Leaf Mall project will provide approximately 22 435 square metres of Gross Leasable Area (GLA) with 2 Anchor Tenants.

This Basic Assessment will conform to the National Environmental Management Act 107 of 1998 and to the Environmental Impact Assessment Regulations published in GN R982/2014 - R985/2014 of 8 December 2014. The Basic Assessment will provide information about the proposed Autumn Leaf Mall, hotel and conference centre and distribution centre (phase 1), and its scope is restricted to this component of the project.

2 STUDY APPROACH

The approach followed by the consultants was based on the specifications for the Basic Assessment Report in terms of the Environmental Impact Assessment Regulations, 2014, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

In short, the study approach followed by the Consultants, entailed the following steps:

- Preliminary site investigations to determine the scope of works of the project and to familiarise with the site were done by the EIA Consultants, the client and specialists in March 2016.
- Specialist ecological input was obtained to investigate the flora, fauna and the general biophysical environment in an attempt to identify the potential impacts of the project.
- The proposed development is covered by the National Heritage Resources Act which incorporates heritage impact assessments in the Environmental Impact Assessment process. A Phase 1 Heritage Impact Assessment was therefore done by a specialist to identify the potential impact on heritage resources.
- Input from an avifauna specialist was obtained to determine the impact of the proposed project on birds.
- In addition, input was provided by a wetland and aquatic specialist to determine the impact on surface water.
- During March 2016 the specialists conducted site investigations.
- The first phase of the Public Participation Programme (PPP) commenced on 23 March 2016 allowing for a 30-day comment period. It included the identification of key stakeholders, the distribution of information letters (BID) with a request for registration and comments, as well as advertising of the project in the local and regional press and on site.
- Specialist investigations continued during the subsequent months. The floodline assessment became available that in addition informed the Final Site Development Plan.
- Notification of an information meeting on 8 August 2016 was submitted to all I&APs on 27 July 2016. The purpose of this meeting was to furnish all interested parties with information regarding the extent of the project, the proposed alternatives, and the extent of the Environmental Impact Assessment Process.
- Written comment was received in the notification phase from:
 - Ngaka Modiri Molema District Municipality – registered as I&AP
 - Woltemade Motors - registered as I&AP
 - Zeerust Ultra - registered as I&AP
 - Andre du Toit Town and Regional Planners - registered as I&AP



- A draft Basic Assessment Report was compiled with the main aim to identify issues, potential impacts and potential alternatives associated with this project. It included a description of the status quo of all relevant environmental components as well as the proceedings of the PPP and communication with registered Interested & Affected Parties (I&APs).
- On 23 August 2016 the draft Basic Assessment Report was distributed for comment.
- The due date for comment on the draft Basic Assessment Report is 27 September 2016. This allows for a comment period of 30 days.
- Subsequently the final BAR will be submitted to the Department of Rural, Environment and Agricultural Development, North West Provincial Government. The final BAR will include all concerns raised to the draft BAR and the responses thereto. The Consultants (EAPs) ensured that all concerns raised are addressed in appropriate detail in the final Basic Assessment Report.

3 PROJECT DESCRIPTION

This environmental application is for the proposed Autumn Leaf Shopping Mall and associated infrastructure in Zeerust.

The site is 282 402 m² or 28.2402ha in size and has a coverage of 13% along with a Floor Space Ratio (FSR) of 0.14. The proposal includes the construction of a mall and free stander drive thru's with a Gross Leasable Area (GLA) of 20 070 m² and Coverage & Floor Space Ratio (FSR) of 40 317 m². The Ground Floor Area of the Mall will have a coverage of 25 277 m². A total of 1618 parking bays will be provided.

The project also includes the construction of three Free Stander Drive Thru's with a Ground Floor Area of 810 m², a Taxi rank and ablution facilities of 75 m². A hotel with 28 rooms is also planned with a coverage of 4 891 m². The hotel will include a conference centre, a day spa and a gym. In addition a Distribution centre is proposed on the western section of the site inclusive of an office and a warehouse.

Associated infrastructure will include access roads and civil services (water, sewer, stormwater reticulation and electricity).

The full scope of works includes the construction/installation of the following as part of phase 1:

Table 1: Phase 1

PHASE 1	Coverage
Shopping Centre	25 277m ²
Distribution Centre	9 320m ²
Drive Thru Restaurants	810m ²
Outside Ablutions	75m ²
TOTAL	35 482m²

An application in terms of Section 56 of the Town-planning and Townships Ordinance, 1986 (Ordinance 15 of 1986), is in addition submitted by the appointed town planner to amend the Town-planning Scheme in operation known as Zeerust Town Planning Scheme, 1980. The application is for the rezoning of Portion 24 (A portion of portion 5) of the farm Hazia No. 240, from "Special" to "Special" for a Shopping Mall including Places of Refreshments; Places of Amusement; Shops; Drive Thru Restaurants; Distribution Centre, a Hotel including Conference facility; a Lounge / Waiting Area; Day Spa; Gym and ancillary land uses.

4 PROJECT LOCALITY

The proposed project (study site) is located approximately 2km east of the Zeerust CBD, and is situated within the Ramotshere Moiloa Local Municipality, North West Province.

The proposed project is set out in the Location Map below.

Site Location

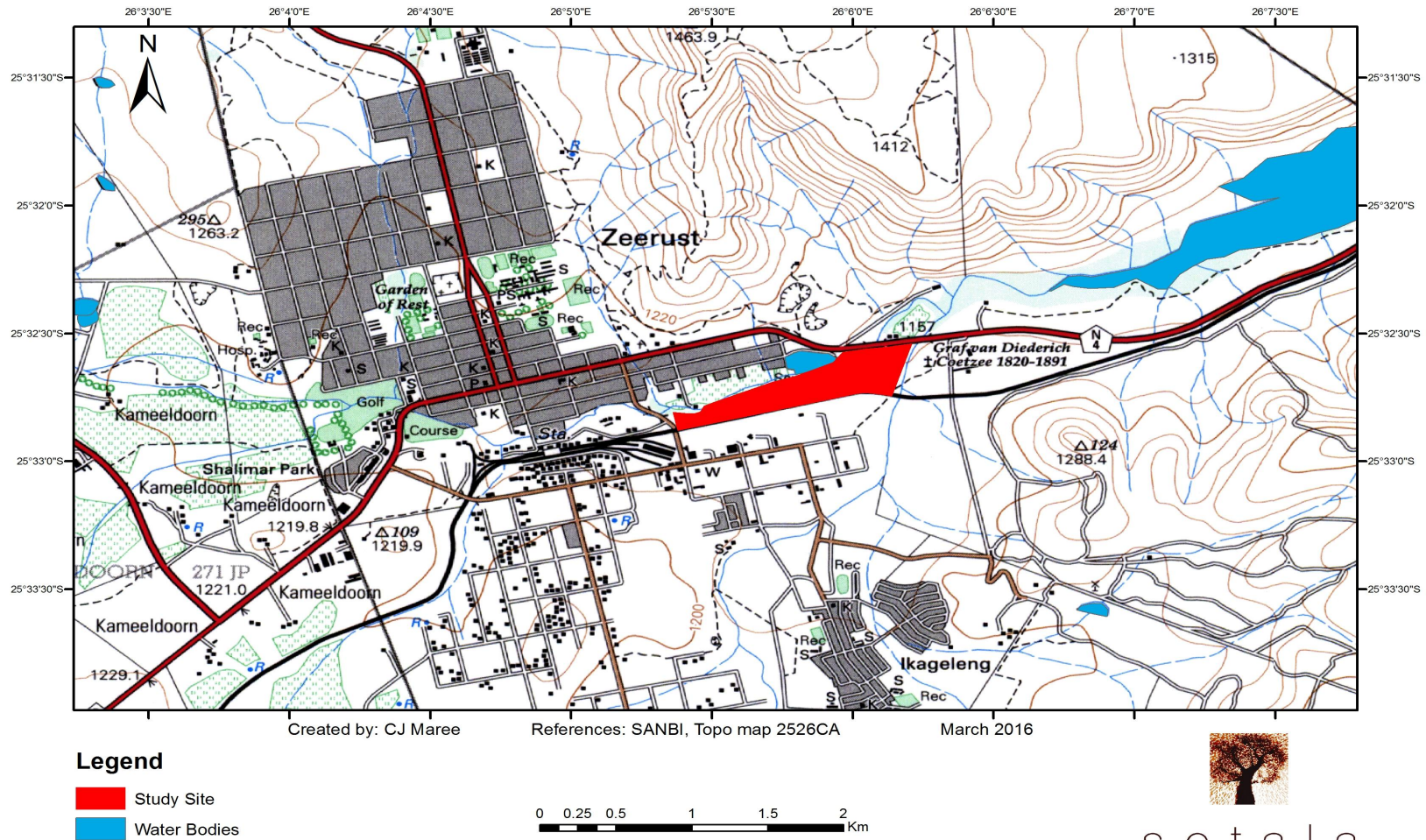


Figure 1: Site Location

The GPS coordinates of the main landmarks within the project area are as follows:

- Zeerust: 25°32'35.31"S; 26°04'43.38"E.
- Study site (Approximate centre point): 25°32'40.10"S; 26°05'59.95"E.
- Entrance into Site from National Road N4: 25°32'33.15"S; 26°06'6.69"E.
- 1:50 000 map grid references: 2526CA (2526CA02 & 2526CA03).

The site is bound by the N4, the Kareespruit, Portion 56 of Hazia 240-JP and Rudolf Street to the north, by River Avenue and the Klein-Marico River to the east, a Rail Way Line on Portion 48 of Hazia 240-JP to the south and by Kloof Street to the west.



Figures 2: Study area location

5 PROPERTY DESCRIPTIONS

The proposed project is located on Portion 24 (a Portion of Portion 5) of the farm HAZIA 240 JP, near Zeerust town situated in the Ramotshere Moiloa Local Municipality, North West Province. The Surveyor-general 21 digit site (erf/farm/portion) reference number is TOJP0000000024000024.

6 TOPOGRAPHY

The topography of the region and study area is comprised of mountains and ridges to the north, east and southeast, with the town of Zeerust and the study area situated as such on the flat valley bottom plains. The Klein Marico Poort Dam lies in the valley within these mountainous areas, to the east of the study area.

The study area itself consists of flat to relatively flat plains, with no significant rises. The average height above sea level of the study area within the open areas varies from about 1 180m to 1 160m. There are also no rocky ridges,

ravines, kloofs or valleys present. There is however, a stream with a lower, incised channel and floodplain, which lies lower than most of the study area.

The site slopes from west to north east with an average gradient of approximately 1.1%. The gradient of the site promotes effective drainage towards the low point on the north eastern corner of the site.

7 SURROUNDING LAND USES

The study site falls within the urban edge of Zeerust. The general landuse of the area is urban development. The study site itself is situated on an old brickyard property in the extreme eastern edge of the town. This area is less densely urbanised with open bushveld, as well as two watercourses. Numerous large, alien weed tree species are present on the property. A wastewater treatment works (WWTW) is situated directly north of the study area while the Zeerust dumping site is situated to the north of the site opposite the National Route N4. A guest farm is situated immediately north of the study area, on the opposite side of the National Route N4 (Kerk Street). A poorly developed industrial area and agricultural holdings area are situated to the south while a railway line forms the southern boundary of the study area.

Presently the study area is a vacant lot, with no businesses or developments taking place. A number of derelict office buildings, factory buildings and vacant brickyard are on the site, which takes up a fair amount of the surface area of the study site.

8 NEED FOR THE PROJECT

The property is located adjacent to the N4 Toll Road between Groot Marico area and Zeerust Central Business District at the eastern entrance to Zeerust. The property enjoys good visibility and good access opportunities, which enhances the potential of the property for Business and/or Commercial purposes.

The Town Planning Application reports that the following uses were identified in the current North West Provincial Spatial Development Framework with specific relevance for the local municipality:

- Zeerust is situated on the Platinum corridor, which intersects with the Western Frontier SDL
- Strengthening of Zeerust as a Regional Node in the North West Province
- Strengthening of Zeerust as one of the main centres to enhance corridor development (Western Frontier)

Ramotshere Moiloa Local Municipality (RMLM) area is characterised by occurrence of very low population, compared to municipalities like Rustenburg. However, 90 000 people (representing 65% of the total population) is concentrated in close proximity to the Platinum Highway and the Gaborone Road. The highest volume of traffic moves on the Platinum Highway and on the Zeerust – Gaborone Corridor. Zeerust is situated on the intersection of two development corridors of national importance namely the Western Frontier (Zeerust – Mafikeng – Vryburg – Taung) and the Platinum SDI (Pretoria – Rustenburg – Swartruggens – Zeerust – Lobatsi). The primary focus of the development corridors is to establish economic development along the major transport routes in order to promote economic growth and the creation of job opportunities. It does not only link with neighbouring provinces but also opens up international linkages with Botswana and Mozambique.

Botswana has become an important trade gateway between Gauteng and the West Coast via the Trans-Kalahari Corridor, a 1 900 kilometre road link from Johannesburg / Pretoria to the Port of Walvis Bay. Whether travelling through Gaborone or Lobatse, the route crosses into South Africa to the town of Zeerust in the North West. From Zeerust, the route moves east to Rustenburg, Sun City and then Pretoria or from Zeerust to Magaliesberg and the Cradle of Humankind.

South Africa and Botswana have signed a Memorandum of Agreement (MoA) that will see the two countries improve cooperation to stimulate economic growth and advance regional integration. The border post serves as a convenient, economic route between South Africa and Botswana, particularly to Zeerust in South Africa and Gaborone, Lobatse and Ramotswa in Botswana.



The Platinum Spatial Development (North West Province) initiative aims to “develop all areas on the N4 Highway that link South Africa’s most densely populated areas with the town of Lobatse in Botswana. By developing nodes along the logistical corridor, the aim is to stimulate economic development. Zeerust stands to benefit from increased traffic along this route, which is ultimately intended to link Namibia and Mozambique.” The international linkage between South Africa is very important for the economic survival of RMLM as most of the international traffic will have to travel through Zeerust. In essence, the more traffic will have to travel through Zeerust, the more money will be spent in Zeerust which has been identified as one of the major economic nodes within RMLM.

Such a proposed development could serve as a powerful economic injection for Zeerust and help to further strengthen the role the town plays as an economic node for RMLM and Botswana and also to take advantage of the N4 Corridor which carries a high volume of traffic passing through Zeerust.

To summarise, it is believed that the proposed facility will enhance the role of Zeerust as a regional shopping facility and in general contribute to offer a wider variety of products in town.

9 LEGAL REQUIREMENTS

9.1 National Environmental Management Act

In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) as amended and the EIA Regulations 2014, an application for environmental authorisation for certain listed activities must be submitted to the relevant authority, the Department of Rural, Environment and Agricultural Development, North West Provincial Government, (DREAD).

A Basic Assessment (BA) process for this proposed project is being undertaken by Setala Environmental. The listed activities for the proposed Autumn Leaf Shopping Mall project are the following:

Table 2: Listed Activities

Listed Activity	Activity/Project Description
<p>GN R983/2014 Activity 19</p> <p>The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from –</p> <p>(i) a watercourse;</p> <p>(ii) the seashore; or</p> <p>(iii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever is the greater –</p> <p>but excluding where such infilling, depositing, dredging, excavation, removal or moving –</p> <p>(a) will occur behind a development setback;</p> <p>(b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or falls within the ambit of activity 21 of this Notice, in which case that activity applies.</p>	<p>To make provision for the excavation or infilling of more than 5 cubic metres of soil from a watercourse if required.</p> <p>Infilling and / or excavation within the 1:100 year floodlines of the will have to be done to construct the access roads along the periphery of the site and for the parking and infrastructure within the 1:100 year flood lines.</p>
<p>GN R983/2014 Activity 27</p> <p>The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for –</p> <p>(i) the undertaking of a linear activity; or</p> <p>(c) maintenance purposes undertaken in accordance with a maintenance management plan</p>	<p>The proposed development will entail the clearance of more than 1 hectare of vegetation, but less than 20 hectares.</p> <p>The impacted study area is 22,713 ha of which 5, 663 ha is highly disturbed and denuded.</p> <p>As a result, less than 20 hectares of indigenous vegetation will thus be cleared.</p>
<p>GN R985/2014 Activity 12:</p> <p>The clearance of an area of 300 square metres or more of indigenous vegetation.</p> <p>(a) In Eastern Cape, Free State, Gauteng, Limpopo, <u>North West</u> and Western Cape provinces:</p> <p>(i) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been</p>	<p>According to the conservation plan of the North-West Province (2009), the area is within a Critical biodiversity area (CBA 1). This includes large areas of the Zeerust town as well. The main reason for the area being a Critical biodiversity area (CBA1) is the importance of the catchment and watercourses of the Marico Rivers in particular for the North-West Province. The watercourses in the region of Zeerust are seen as being under threat and therefore in</p>



<p>identified as critically endangered in the National Spatial Biodiversity Assessment 2004;</p> <p>(ii) Within critical biodiversity areas identified in bioregional plans;</p> <p>(iii) Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; or</p> <p>(iv) On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.</p>	<p>need of conservation.</p>
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Description of Listed activities associated with the Project's activities

1 GN R983/2014 Activity 19:

The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from –
(i) a watercourse;

To make provision for the excavation or infilling of more than 5 cubic metres of soil from a watercourse if required. Infilling and / or excavation within the 1:100 year flood lines will have to be done to construct the access roads along the periphery of the site. Parking bays and infrastructure within the 1:100 year flood lines will also require infilling and / or excavation.

2 GN R983/2014 Activity 27:

The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation.

The study area and the surrounding region fall within the Savanna Biome, which is also known as the Bushveld Biome. According to the vegetation classification of Mucina & Rutherford (2006) the study area is found in the veldtype known as Zeerust Thornveld. According to Mucina & Rutherford the conservation status of Zeerust Thornveld is Least Concerned (LT).

There are areas of the property that have been left as 'wild veld', but there are no areas of pristine Zeerust Thornveld present. The vegetation of the study area is representative of Zeerust Thornveld with deciduous, open short thorny woodland in patches. The natural veld, where it occurs, is dominated by Acacia thorn tree species with an herbaceous layer of mainly grasses on deep, high base-status and some clay soils on plains and lowlands. The majority of the vegetation of the study area, especially the large, central area is disturbed.

The construction of the proposed shopping mall and associated structures will entail the clearance of more than 1 hectares of indigenous vegetation, but less than 20 hectares. The impacted study area is 22,713 ha of which 5, 663 ha is highly disturbed and denuded. As a result, less than 20 hectares of indigenous vegetation will thus be cleared.

3 GN R985/2014 Activity 12:

The clearance of an area of 300 square metres or more of indigenous vegetation.

(a) In Eastern Cape, Free State, Gauteng, Limpopo, North West and Western Cape provinces:

- (i) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;*
- (ii) Within critical biodiversity areas identified in bioregional plans;*
- (iii) Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; or*
- (iv) On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open*



space, conservation or had an equivalent zoning.

According to the conservation plan of the North-West Province (2009), the area is within a CBA 1 area. This includes large areas of the Zeerust town as well. The main reason for the area being a Critical biodiversity areas (CBA1) is the importance of the catchment and watercourses of the Marico Rivers in particular for the North-West Province. The watercourses in the region of Zeerust are seen as being under threat and therefore in need of conservation.

9.2 National Water Act

The National Water Act, 1998 (Act No. 36 of 1998) (NWA) regulates the use of water and the pollution of water resources. Section 19 of the NWA regulates pollution of a water resource and Section 21 of the NWA lists the water uses for which a water use licence (WUL) is required. A Water Use Licence Application (WULA) will have to be submitted to the Department of Water and Sanitation (DWS).

The Water Use Licence Application (WULA), is for the activities in connection with the construction and operation of a shopping centre, including a fuel service station (proposed Autumn Leaf Phase 2), hotel, day spa, and gym for the water uses as defined for the impeding or diverting of the flow of water in and altering the bed, banks and or characteristics of a watercourse (river diversion) in terms of Section 21(c) and (i) of the National Water Act, 1998 (Act 36 of 1998) as amended.

10 FEASIBLE AND REASONABLE ALTERNATIVES

During investigations various alternatives within the larger study area were investigated. The best options will be determined through the environmental and specialist studies, as well as public opinion.

The following alternatives have been identified and are described as follows:

10.1 Site alternatives

Akani Properties (the applicant) is the landowner and it is not feasible to consider other sites in terms of location alternatives. Alternative locations are therefore currently not available and would involve the lease or purchase of land / other sites. The site is regarded as ideal for the development of a mall due to the location along the N4 Highway which will provide visibility and easy access to the mall.

A portion of Portion 24 (a Portion of Portion 5) of the farm Hazia 240 JP is thus the only site alternative. Layout and design alternatives will be considered.

Table 3: Site Co-ordinates:

Description (4 corners of site)	Lat (DDMMSS)	Long (DDMMSS)
North East	25°32'32.44"S	26° 6'12.70"E
North West	25°32'48.92"S	26° 5'21.00"E
South East	25°32'44.80"S	26° 6'8.26"E
South West	25°32'52.92"S	26° 5'22.14"E



10.2 Layout Alternatives

As mentioned above no off-site or other site alternatives have been investigated due to the fact that this property is owned by the developer, and located with an urban area. However layout design alternatives were assessed and a preferred alternative identified. The limitations inherent in this scenario are understood.

The sensitive areas identified during field investigations are the Kareespruit (Stream) and the Klein-Marico River, as well as their associated riparian zones. The riparian zone needs to be viewed as being a part of the watercourse ecosystem. There are no other sensitive areas or habitats identified such as rocky outcrops (koppies) or areas of protected trees, etc.

There are no natural habitats or areas in a pristine condition. The watercourses, like all watercourses encountered, should be approached as sensitive. These areas were thus demarcated and rated as having a sensitivity rating of High. These areas should ideally be viewed during project planning and development as 'No-Go' zones.

The layout options were investigated in terms of the layout for the proposed establishment so as to accommodate the riverine area. As the property is located between the Klein Marico River and the Karee Spruit it is therefore impacted by flood lines as indicated and endorsed by the relevant engineer on the below Site Development Plan. The flood line Assessment was conducted by Klunene Consulting Civil Engineers. (Appendix G refers)

Preferred Alternative 1

The preferred and final layout Alternative was in consideration of the flood lines and sensitive water course areas.

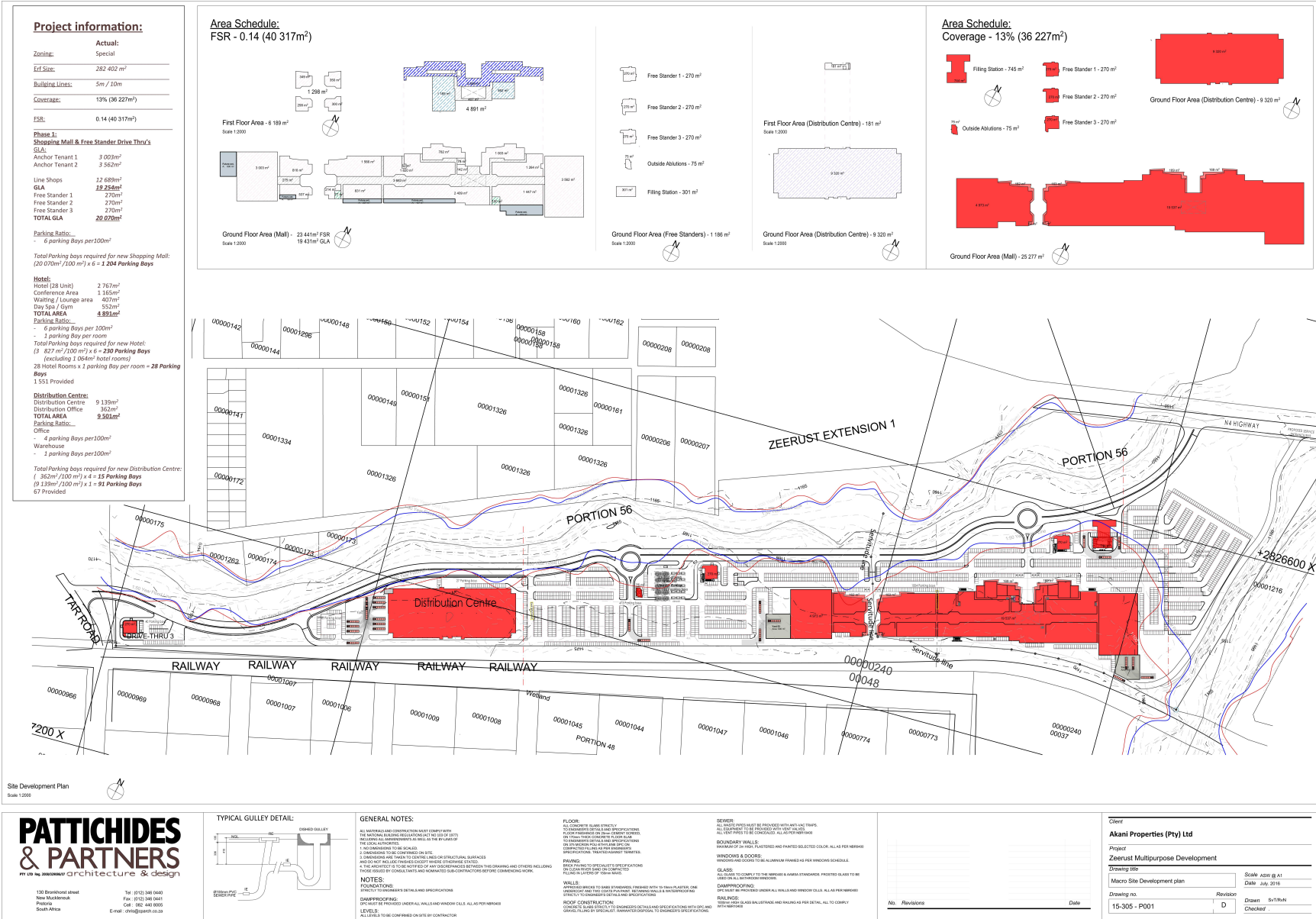


Figure 3 : Preferred Layout Alternative 1

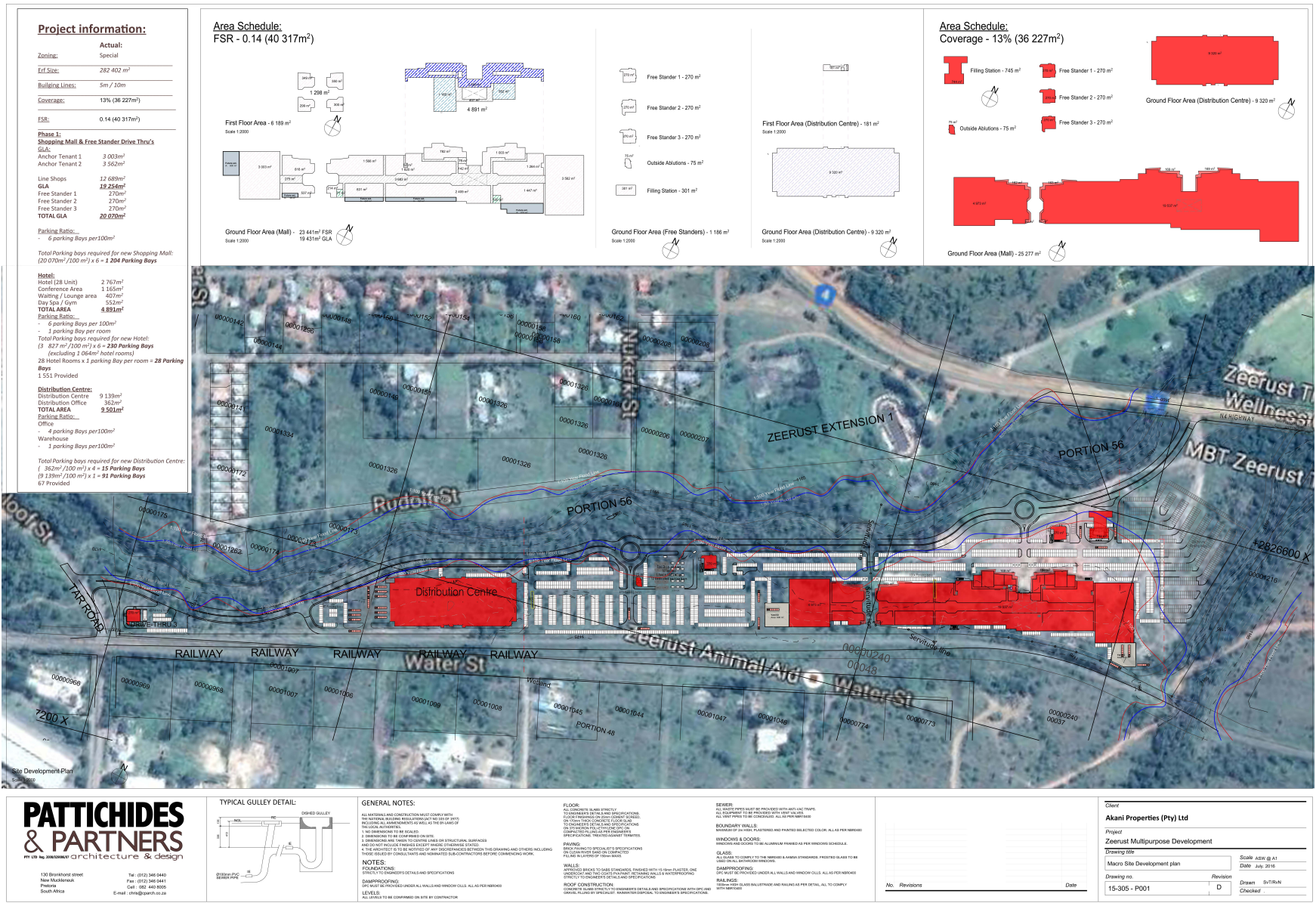
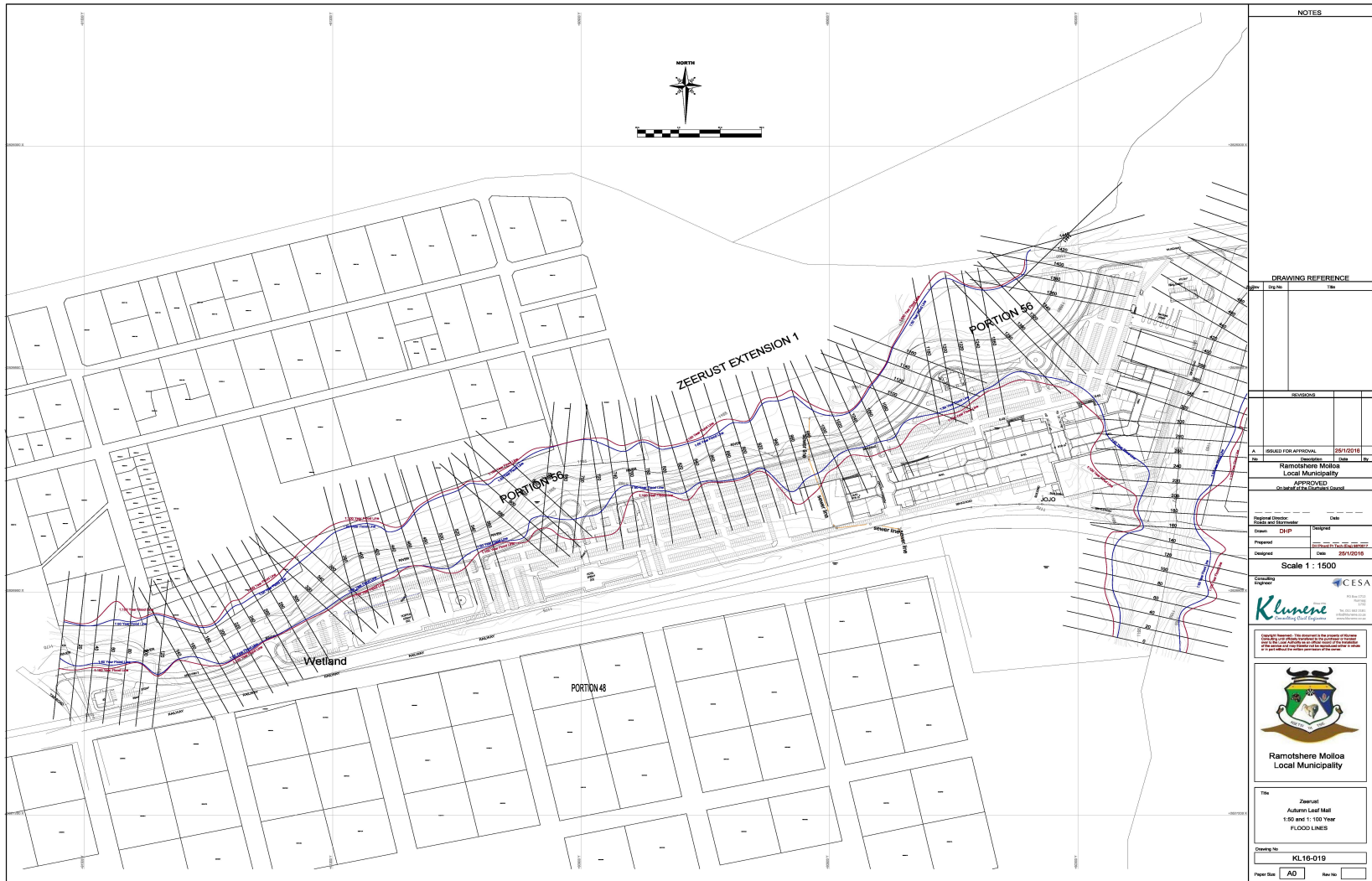


Figure 4: Preferred Layout 1 imposed on Google Earth



NOTES

DRAWING REFERENCE

Dwg No.	Title

25/12/2018

A. ISSUED FOR APPROVAL 25/12/2018

Ramotshere Moiloa Local Municipality
APPROVED
 On behalf of the Executive Council


Regional Director: _____ Date: _____
 Clerk and Administrator: _____ Date: _____
 Design: _____ Date: 25/12/2018

Scale 1 : 1500

Consulting Engineer: **CESA**

Klemene
 Consulting Civil Engineer

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Ramotshere Moiloa Local Municipality

Title: Zeerust Autumn Leaf Mail 1:50 and 1:100 Year 1 FLOOD LINES

Drawing No: **KL16-019**

Paper Size: **A0** Rev No: _____

Figure 5 : Layout Alternative 2

Alternative 2

This layout Alternative was without consideration of the flood lines and the sensitive areas of the two watercourses. As seen in the SDP on the previous page a huge portion of the development are within the 1:100 year floodline areas.

10.3 Activity alternative

Agricultural potential

More than 80% of the North West Province's economic activity is concentrated in the southern region between Potchefstroom and Klerksdorp and in the eastern region around Rustenburg. The fertile, mixed-crop farming lands are predominantly around Rustenburg and Brits, while the Marico region is more cattle country.

The true agricultural potential of a small study area is difficult to gauge accurately, as it is qualitative in nature rather than quantitative. Soil form and depth and chemical analyses need to be conducted to firstly determine the true potential of the soils. Added to this a person needs to consider the availability of irrigation water and annual rainfall figures, along with monthly temperature average which determine the length of the active growing season. All this data forms background information that must then be considered and interpreted in the context of potential and realistic land uses for the area. The resulting calculated or perceived agricultural potential does not automatically imply that this potential will be attained in all instances as management, technical skills, knowledge, equipment, irrigation systems, etc. vary considerably.

No agricultural activities are presently taking place within the study area. Historically, none or very low-level activities have taken place. The present size and setting of the land parcel do not lend itself to any commercial agricultural practices of any significant value. This is not to say that no agricultural activities, especially in terms of cultivation, are possible on the study site.

Crop production

The soils found on the site are generally of medium/low to low agricultural potential (in terms of dryland and irrigated cropping) due to a number of reasons. These are:

- The soils are generally leached, sandy and gravelly, which are generally poor in nutrients.
- Although present, there is a lack of deep, nutrient-rich and well-drained soils ideal for cultivation.
- The lack of naturally good cultivation soils, within a small area, makes the agricultural potential of the study site, in terms of crop-yields and economic value low.
- Large areas in the centre of the study area have been badly degraded and compacted over the years from the brickyard and factory. Such soils take a number of years to recover and improve even when cultivated regularly.

Cattle production

The study area is too small for any meaningful commercial cattle production in terms of grazing lands. The area is hemmed in between various roads, railway lines and urban areas. The small size of the area and the low soil nutrient levels which limit good grass production, limits the carrying capacity of the site for meaningful economic cattle farming.

The study area as a unit has medium/low to low agricultural potential. Nearly all of the land in the study site has been calculated, as being 'low potential arable land' Due to the size of the study area and low richness of the soils the natural carrying capacity of the site is low in terms of grazing for cattle. The agricultural potential in terms of cattle farming is therefore 'low potential grazing land'.

Agriculture could therefore not be considered as an alternative for this property.

10.4 No-Go Alternative

It is suggested that **to maintain the status quo is not the best option for the macro environment.**

According to Mucina & Rutherford (2006) the conservation status of Zeerust Thornveld is Least Concerned (LT). However, it needs to be kept in mind that those studies were conducted ten years ago. According to the North West Province Biodiversity Conservation Plan (NWBCP) (2009) the conservation status is Near Threatened (NT). NT is a more sensitive status than LT. The conservation status needs to be viewed not just nationally but also provincially and therefore the conservation status for the veld type in terms of the project should be taken to be Near Threatened (NT). The veldtype is therefore presently not threatened.

A potential fatal flaw (or flaws) from a biodiversity perspective is seen as an impact that could have a "no-go" implication for the project. A 'no-go' situation could arise if residual negative impacts (i.e. those impacts that still remain after implementation of all practical mitigatory procedures/actions) associated with the proposed project were to:

- a) Conflict with international conventions, treaties or protocols (e.g. irreversible impact on a World Heritage Site or Ramsar Site);
- b) Conflict with relevant laws (e.g. clearly inconsistent with NEMA principles, or regulations in terms of the Biodiversity Act, etc.);
- c) Make it impossible to meet national or regional biodiversity conservation objectives or targets in terms of the National Biodiversity Strategy and Action Plan (BSAP) or other relevant plans and strategies (e.g. transformation of a 'critically endangered' ecosystem);
- d) Lead to loss of areas protected for biodiversity conservation;
- e) Lead to the loss of fixed, or the sole option for flexible, national or regional corridors for persistence of ecological or evolutionary processes;
- f) Result in loss of ecosystem services that would have a significant negative effect on lives (e.g. loss of a wetland on which local communities rely for water);
- g) Exceed legislated standards (e.g. water quality), resulting in the necessary licences/approvals not being issued by the authorities (eg. WULA);
- h) Be considered by the majority of key stakeholders to be unacceptable in terms of biodiversity value or cultural ecosystem services.

There are no issues with regard to the criteria listed above (a to h), as far as the proposed project is concerned. There are no fatal flaws and the project may go ahead. There are 'No-Go' areas within the study site and these are the watercourses. However, recommended mitigating measures must be implemented.

The do-nothing ("no go") option would entail not using the site and maintaining the site as is. From certain perspectives this is not a viable option as the site is situated within an urban area surrounded by either upcoming or already existing residential communities. By not developing the site, the site will be anomalous in the context of the surrounding urban residential land-uses, and some of the direct and indirect socio-economic benefits (i.e. job creation, etc.) will not materialise.

From an ecological perspective, the site has a certain degree of ecological sensitivity due to the presence of the two watercourses, however much of the ecological linkages between the site and surrounding natural areas have been lost due to the increase in development around the site. Not developing the site will assist in protecting the natural features on the site, however the development as proposed will maintain the watercourse areas as an undeveloped but importantly as an actively managed and controlled area.

The No-Go development alternative could therefore not be considered the responsible way to manage the site.



11 SPECIALIST INPUT

Specialist input was obtained to investigate the impact of the various alternatives that could accomplish the purpose of the project. The specialist input is summarised as follows:

11.1 Retail Market study

A Retail Market study has been conducted by Fernridge Consulting . Refer to Appendix G.

External Study Summary

- The site being studied is located along the N4 national road ± 2 km east of the Zeerust town centre. Zeerust is located ± 68 km north east of Mafikeng and ± 55 km southeast of the Skilpadhek RSA/Botswana border post.
- The proposed site is decentralized from the Zeerust CBD and located on the eastern periphery of the town. The site was rated "Average" 60% using the Site evaluation model. The site is well located on the main road, and will enjoy good visibility to passing motorists on the N4. Landclearing will open up greater visibility. However, the site is somewhat removed from the CBD and can be bypassed by Botswana and Lehurutshe residents travelling to Mafikeng for shopping purposes. It will be important to have a good working relationship with local taxi to ensure that a connection is provided from the town to the site. This additional taxi fee can also become a barrier keeping residents from accessing the proposed site.
- There are currently two formal shopping centres within the catchment area, namely, the Lehurutshe shopping centre ($\pm 17,500\text{m}^2$ GLA) and the Zeerust shopping centre ($\pm 5,222\text{m}^2$ GLA). Additionally, Zeerust has a good representation of street front and freestanding national retail brands. The catchment area has an estimated total Retail GLA of $\pm 128,692\text{m}^2$.
- The study calculated a combined annual growth rate of $\pm 1.11\%$. The growth rate was used to forecast the current (2015) and future (2017) demographic counts. From fieldwork, it was observed that there is limited residential growth to the north of the Zeerust CBD, with most of the development concentrated to the south of the town. It is important to consider that this growth is dominantly within the medium to low income bracket (D to D Zero). Such developments were factored in when calculating the demographics.
- The primary research is in line with the Census findings that the catchment area is predominantly home to a black racial profile ($\pm 93\%$), with Setswana and Afrikaans being the most frequently spoken homelanguages. The Africa Eye Income data showed that the area primarily consists of a lower income market with $\pm 83\%$ of households residing in the catchment area falling in the D to D Zero income groups. 17% fall in the middle to upper income groups (C to A++).

Primary Research Summary

- The forecasted 2017 catchment demographic warrant $\pm 175,787\text{m}^2$ GLA retail demand, however, there is currently a $\pm 128,692\text{m}^2$ GLA retail supply. This translates into a $\pm 47,095\text{m}^2$ GLA retail undersupply.
- With reference to the RPE model, if the proposed centre could capture at least a 12% marketshare from the 2017 demographic count, then one can justify a GLA of $\pm 17,000\text{m}^2$ to $\pm 18,000\text{m}^2$.

Conclusion: Retail

The study recommends that $\pm 17,000\text{m}^2$ - $\pm 18,000\text{m}^2$ GLA retail centre would be more suited for the proposed site by 2017 and will require a more achievable capture rate of $\pm 12\%$ marketshare. Additional phases can be considered post 2017, IF the market grows, and the centre trades well to the point with no vacancies and tenants asking for additional trading space. Therefore it is also good to design for a phase 2 from day one.

It is also recommended that the filling station, the taxi rank and drivethru's as proposed, such development will be beneficial in establishing a decentralized node at the proposed site – in flow generators and synergy.

11.2 Biodiversity Assessment

A Biodiversity Assessment has been conducted by Setala Environmental. Refer to Appendix G. The report identified the following:

11.2.1 Terrestrial Ecology

Vegetation

The study area is within the Savanna Biome and the Central Bushveld Bioregion. The vegetation of the study area is representative of Zeerust Thornveld with deciduous, open short thorny woodland in patches. The natural veld, where it occurs, is dominated by Acacia thorn tree species with an herbaceous lower layer of mainly grasses on deep, high base-status and some clay soils on plains and lowlands. The majority of the vegetation of the study area, especially the large, central area is badly disturbed and degraded. Until recently, the property was an active brick-making and distribution yard.

The Kareespruit (Stream) and the Klein-Marico River border the study area to the north and east, respectively. The vegetation within the riparian zones of the stream and river is that of *Acacia – Combretum - Celtis* woodland.

Priority species

There are no priority species, including red data species.

Protected trees in the study area

There are no protected trees in the study area.

Fauna

No priority faunal species (which includes red data species) were encountered during field investigations.

11.2.2 Aquatic Ecology

Watercourses in the study area

Two rivers were identified during field investigations. These are the Kareespruit (Stream) and Klein-Marico River. No other watercourses, including wetlands or farm dams are present on the study site. The Kareespruit flows into the Klein-Marico River, which in turn flows into the Klein Marico Poort Dam.

Drainage regions

The study area is situated within the primary drainage area (PDA) of A, and the quaternary drainage area (QDA) of A31D. The area is within the Crocodile & Marico West Management Area (WMA 3) and under the jurisdiction of the newly proposed Limpopo Catchment Management Agency (CMA 1).

Present Ecological State (PES) of watercourses in the study area

A summary of the PES values and categories of the watercourses identified are as shown in the table below.

Table 4: PES

Criteria	Identified Watercourses	
	Kareespruit	Klein-Marico
Category:	C	C
Integrity (PES):	Medium	Medium
PES Description	Moderately Modified	Moderately Modified
Recommended Environmental Management Class	C	C

Ecological importance and sensitivity (EIS) of watercourses in the study area

A summary of the EIS values and categories of the watercourses identified are as shown in the table below.

Table 5: EIS

Determinant	Kareespruit	Klein-Marico	Confidence
Overall EIS	C	C	-
Description	Moderate	Moderate	-

Drivers of ecological change

The main drivers of ecological change on the watercourse/s and water ecosystems in the study area are:

- Urbanisation;
- Faulty and poor managed WWTW;
- Water quality changes due to upstream impacts; and
- Over-utilisation of natural resources.

The two watercourses in the study area are important in terms of water supply for irrigation and general human consumption. The water from both these watercourses in the vicinity of the study area supply water to the important Klein-Marico Poort Dam.

Sensitivity analyses

The ecological sensitivity of the study area is determined by combining the sensitivity analyses of both the floral and faunal components. The highest calculated sensitivity unit of the two categories is taken to represent the sensitivity of that ecological unit.

Ecological sensitivity analysis

Table 6:

Ecological community	Floristic sensitivity	Faunal sensitivity	Ecological sensitivity	Development Go-ahead
Thornveld	Medium	Medium	Medium	Go-But
Watercourses	Medium/High	Medium/High	Medium/High	Go-But

Fatal flaws

There are no fatal flaws. However, development directly within the Kareespruit or Klein-Marico would constitute a fatal flaw.

Priority areas

The study site is not situated within any priority areas. Priority areas include protected areas, important bird areas (IBA), wetlands and National protected areas expansion strategy (NPAES) focus areas.

North-West Province Biodiversity Conservation Plan

According to the conservation plan of the North-West Province (2009), the area is within a Critical biodiversity area (CBA 1). This includes large areas of the Zeerust town as well.

The main reason for the area being a CBA1 area is the importance of the catchment and watercourses of the Marico Rivers in particular for the North-West Province. The watercourses in the region of Zeerust are seen as being under threat and therefore in need of conservation.

Identified sensitive areas

The sensitive areas identified during field investigations are the Kareespruit (Stream) and the Klein-Marico River. As well as their associated riparian zones. The riparian zone needs to be viewed as being a part of the watercourse ecosystem. There are no other sensitive areas or habitats identified such as rocky outcrops (koppies) or areas of protected trees, etc.

There are no natural habitats or areas in a pristine condition. The watercourses, like all watercourses encountered, should be approached as sensitive. These areas were thus demarcated and rated as having a sensitivity rating of High. These areas should ideally be viewed during project planning and development as 'No-Go' zones. The sensitivity map is shown below.

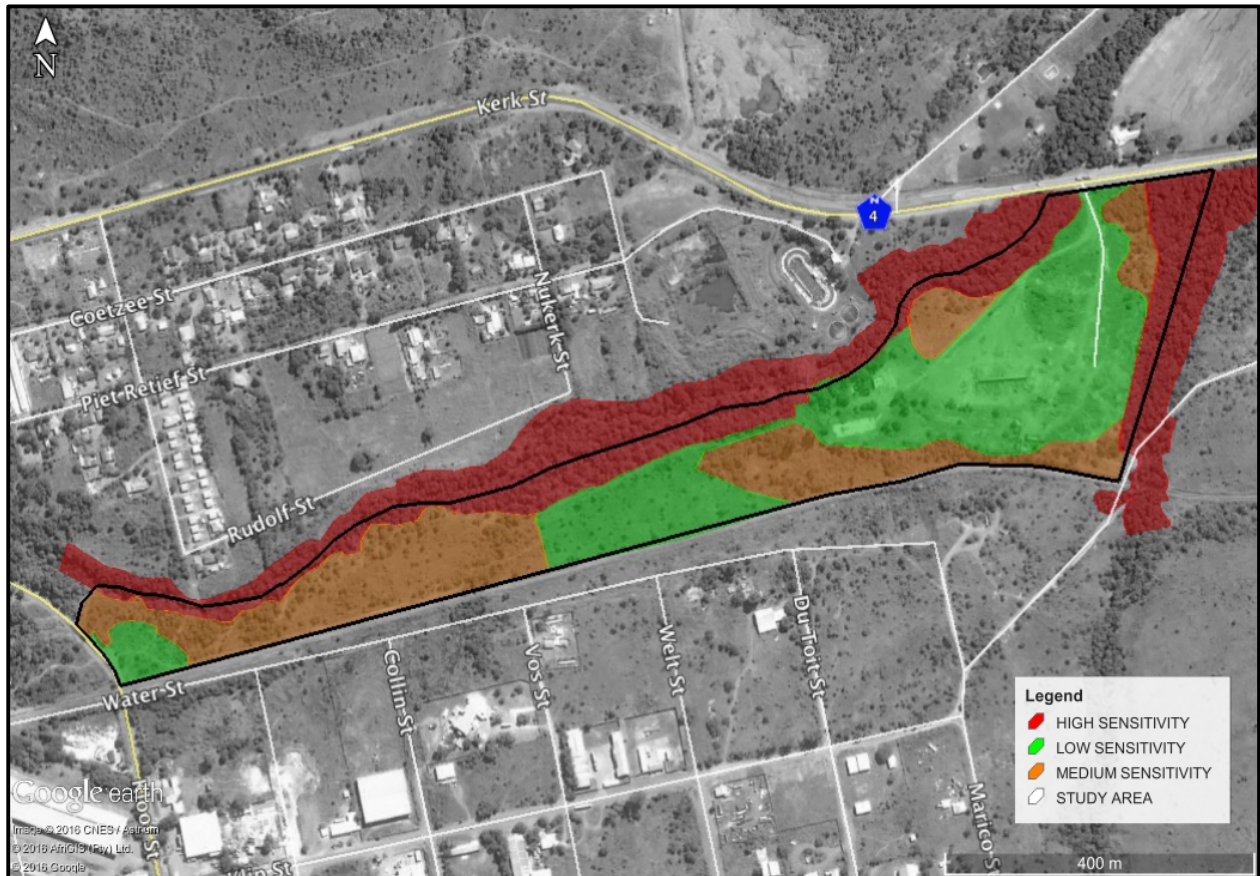


Figure 6: Sensitivity map

Mitigating measures

Mitigating measures have been recommended and need to be implemented to validate the findings and sensitivity demarcations of the report.

The main mitigating measures put forward are:

- Any temporary storage or accommodation facilities to be setup during construction to be within existing built-up or disturbed areas only.
- No temporary facilities or portable toilets to be setup within 50m of any watercourses and riparian zones.
- Avoid impeding or diverting waterflow during construction phase.
- Do not develop within the watercourse or riparian zone.
- Do not develop within the 1:100 flood lines.
- Do not remove any indigenous trees from the riparian zone.
- Ensure a proper Stormwater Management Plan is compiled and implemented.

11.3 Heritage Impact Assessment

A Heritage Impact Assessment has been conducted by Integrated Specialist Services. Refer to Appendix G.

A Heritage Impact Assessment (HIA) is the process to be followed in order to determine whether any heritage resources are located within the area to be developed as well as the possible impact of the proposed development thereon.

- A Phase I Heritage Impact Assessment (HIA) study was done and no heritage resources as outlined in Section 3 of the National Heritage Resources Act 25 of 1999 were found in the project area.

The report makes the following observations:

- Most sections of the project area are very accessible and the field survey was effective enough to cover significant sections of the project receiving environs. However, some portions of the proposed development site had limited access because of thick vegetation cover.
- The project area is predominantly industrial, commercial agricultural.
- Large sections of the proposed development site are severely degraded from existing developments such as clearing for brick moulding infrastructure, access roads, railway line, power lines and other industrial activities.

Recommendations/Mitigation

Should construction work begin for this project:

- The construction teams should be inducted on the significance of archaeological resources that may be encountered during subsurface construction work before they work on the area in order to ensure appropriate treatment and course of action is afforded to any chance finds.
- If archaeological materials are uncovered, work should cease immediately and the SAHRA be notified and activity should not resume until appropriate management provisions are in place.
- If any evidence of archaeological sites or remains (eg, remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, marine shell and charcoal/ash concentrations), unmarked human burials, or other categories of heritage resources are found during the proposed activities, SAHRA APM Unit (Philip Hine, 021 462 4502) must be alerted immediately, and a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contacted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological significance, a Phase 2 rescue operation might be necessary.

This report concludes that the impacts of the proposed development on the cultural and environmental values are not significant.

11.4 Town Planning

The “Application for amendment of land use management scheme” has been compiled by Phure Consulting. Refer to Appendix G.

Existing and surrounding zoning

In terms of the Zeerust Town Planning Scheme, 1980, Portion 24 (A portion of portion 5) of the farm Hazia No. 240, Registration Division JP, North West Province is currently zoned “Special”. The subject property is situated in an area which is predominantly zoned for Agricultural, Industrial and Residential uses.

Most properties in close proximity to the subject property are zoned Residential 1 in terms of the current Zeerust Town Planning Scheme, 1980. A cluster of approximately 20 properties is zoned “Residential” directly west of the site in terms of the Scheme. Directly to the south of the site, “Industrial” zoned erven are situated.

Application

Application is made in terms of Section 56(1) of the Town Planning and Townships Ordinance, 1986 (Ordinance 15 of 1986) for:

The amendment of the Zeerust Town Planning Scheme, 1980 by:

- a) The rezoning of Portion 24 (A portion of portion 5) of the farm Hazia No. 240, Registration Division JP, North West Province from “Special” to “Special” for:
 - a Shopping Mall including Places of refreshments; Places of amusement; Shops; Drive Thru Restaurants;
 - Distribution Centre;
 - a Hotel including Conference facility; Lounge / Waiting Area; Day Spa; Gym and ancillary land uses.



The following development control parameters are proposed:

Table 7:

Development parameters	Proposed
Zoning	Special
Maximum Coverage	50%
Maximum F.A.R	0.3
Maximum Height	4 storeys
Parking Requirements	In terms of the Zeerust Town Planning Scheme, 1980

Desirability

1 Compliance with forward planning policies

1.1 Ramotshere Moiloa Spatial Development Framework, SDF 2014 - 2015: *Development Suitability*

In terms of the Ramotshere Moiloa SDF 2014 - 2015, the subject property is located in an area which is earmarked as Municipal Open Space Network. The site is located adjacent to areas earmarked for future medium density and mixed uses and will therefore be suitable for the proposed use. A need for a diversification of land uses exist in the area as identified in terms of the Council forward planning policies.

It is anticipated that the current growth of the residential sector in the area will assume greater momentum, and that the expansion and infill development will occur as a result.

1.2 Zeerust Urban Edge, Ramotshere Moiloa Spatial Development Framework, SDF 2014 - 2015

The subject site is located within the Zeerust Urban Edge.

1.3 Business Pattern and Potential and Local Economic Development, Ramotshere Moiloa LM Spatial Development Framework, 2014 – 2015

Zeerust is seen as a regional / district node serving the urban area of Zeerust as well as the rural areas (villages / commercial farms). Zeerust is situated on the intersection of two development corridors of national importance namely the Western Frontier (Zeerust-Mafikeng-Vryburg-Taung) and the Platinum SDI (Pretoria-Rustenburg-Swartruggens-Zeerust-Lobatsi).

The primary focus of the development corridors is to establish economic development along the major transport routes in order to promote economic growth and the creation of job opportunities. It does not only links with neighbouring provinces, but also opens up international linkages with Botswana and Mozambique.

The economic strength of the Municipality lies in retail, general government functions, community and social services as well as financial services. These industries have experienced a steady increase over the years with the retail industry employing 38% of the employed citizens of the Municipality.

In furthering the development initiatives of the Municipality, it is key that Zeerust reach its full potential by focussing on the commercial growth of the town.

1.4 Local Economic Development in terms of the Integrated Development Plan (IDP) 2015 - 2016

According to the current IDP, there is a need for both urban and rural development strategy to be put in place with different implications for the provision of infrastructure. The rural areas are characterised by high levels of poverty, especially among those women-headed households. Other major needs or problems are lack of employment opportunities and limited agricultural base.

It is therefore very important that care must be taken that when opportunities other than agriculture arise; they should fit in with a sustainable urban structure. The municipal area should be able to sustain itself when the limited mining deposits and agricultural base are depleted.

It is however important to enhance opportunities in small towns such as Zeerust. This will not only induce new investments but will also enhance economic growth in Zeerust and Ramotshere Moiloa in general. There is a clear need for a Local Economic Development approach which will make provision for local government, private sector and communities to play an active role in securing growth and development.

To ensure long term sustainability, whilst also strengthening the economic base, it is important to follow a policy of diversification. It is proposed that due to limited opportunities in the area, strengthening the local business might be an important role player in this regard. The area is slowly transforming from agricultural character to almost an urban Environment.

In terms of small business and job creation, the North West Master Plan Implementation Programme encourages the public sector to assist in the development of infrastructure that may be associated with labour intensive practices.

Summary

- From the developers perspective, the property is very well located in terms of surrounding land uses, but especially access and visibility to be developed for business related land uses.
- The proposed development will be of a scale and quality generally ascribed to a local shopping / retail centre and it is submitted that the development will not have any negative impact on the surrounding existing or future developments but will rather serve Zeerust as a Regional Shopping Node and enhance the existing residential developments and uses in the area.
- This application should not be evaluated as a competition to the current CBD. The intension is not to duplicate the CBD, but to create a shopping facility to complement and support existing facilities in Zeerust and the need that exists as an integral part of the hierarchy of businesses in Zeerust.
- The shopping facility will contribute to expand the role Zeerust plays in a large service area and attract more consumers to the town.
- The facility will ensure that the loss of buying power to cities like Rustenburg, Pretoria and Johannesburg is limited. Especially with the enhanced access by means of the N4.
- The type and variety of tenants in the proposed development will increase the variety of choice of goods and services offered to satisfy the needs of the consumers
- The application is further in line with the modern town planning principles to support the integration of land uses and to create a more balanced economy.
- The application is also in line with Municipal Policies.
- Access to and from the site will be via the existing road network and would also not affect the thorough traffic.

According to the Town Planning memo the need and the desirability of the application has been proved beyond all doubt.

11.5 Geotechnical investigation

A preliminary geotechnical investigation was conducted by M. J. van der Walt Engineering Geologist CC. Appendix G refers. The findings are summarised as follows:

According to the available geological map Zeerust and its surrounds are underlain by sediments (shale and slate that contains andalusite) of the Timeball Hill Formation belonging to the Pretoria Group, Transvaal Supergroup. Diabase of Post Transvaal geological age has intruded the sediments along planes of weakness. A thick diabase sill is present in the vicinity of the site. The bedrock is sequentially overlain by residual and transported soils.

A thick layer of clayey alluvium that contains variable amounts of rounded gravel was encountered in the flatter northern portions of the site associated with the flood plains of the two rivers. A pebble marker horizon was encountered sporadically across the site and these two soil layers are both classed as Recent Deposits. A layer of fill was observed in the test pits excavated in southern and south-western portions around the existing structures. The bulk of the fill was placed to raise the area and/or to create level platforms for the structures. Scattered sub-outcrop of diabase was observed mainly in the central portion of the site during the investigation. A thin layer of



slimes was encountered at the top of the profile in the test pits excavated in the central and northern portions of the site. According to the owner this is remnants of the andalusite mining activities in the area.

The pebble marker horizon encountered represents the most recent major geological unconformity in the soil profile and occurs at the base of the transported soil. This is generally a zone of high permeability as it contains abundant gravel.

Shallow Seepage

Although no water seepage associated with the presence of a shallow perched water table was encountered during the investigation the necessary damp proofing precautions should be taken underneath all structures and provision will have to be made to prevent ingress of water beneath foundations.

The presence of calcrete nodules in the soil profile as well as the gleyed texture observed in the soils is however an indication of a seasonal fluctuating water table. It is thus possible that a shallow perched water table could develop within the clayey alluvium and possibly on the residual soil/rock interface during the wet season. Zone A is fairly flat and problems with ponding of surface water could be experienced during the wet season especially after periods of heavy or prolonged rains. The installation of sub-surface drainage systems should be considered to intersect the potential shallow perched water table and to assist with drainage during the wet season to avoid ponding of surface water. Surface run-off from the higher-lying ground should be adequately controlled and disposed of to prevent erosion and potential flooding of the lower-lying areas.

The developer should take cognizance of this and ensure that the necessary precautions are taken to prevent problems both during as well as after construction.

Further it is recommended that all constructed embankments exceeding 1,5m or as deemed necessary by the design engineers be stabilized and/or protected by means of retaining walls. Embankments should be adequately compacted and protected from erosion.

11.6 Electrical Services

An Electrical Services report has been compiled by CPE Consulting Engineers. Refer to Appendix G.

The Ramotshere Moiloa Local Municipality is the electricity supply authority in the area. The site has an existing supply of approximately 100kVA with a point of supply situated under the township overhead MV ring supply, that crosses the site, towards the main road.

As this is multiple developments on 1 erf, it is expected that a single bulk metered connection from Council with private internal network, and sub metered entities, will be required. The main supply Zeerust Municipal 88/22/11kV substation is in the process of being upgraded, with an additional 20MVA transformer. This main substation is approx. 2km away (in cable length) from the site, and it is proposed that a dedicated supply, preferably underground via 2x185Cu cables may be installed to supply the Shopping Centre Complex with a total of 6.5MVA at 11kV for all phases of Development as indicated in the engineering report.

11.7 Engineering Services

A report titled "*Concept Services report: Roads, stormwater, water and sewer*" has been compiled by Klunene Consulting Civil Engineers. Refer to Appendix G.

11.7.1 Bulk Services

Zeerust is a well-established town with existing municipal services for water, sewer, roads and stormwater.

Water Reticulation

From information obtained from the Ramotshere Moiloa Local Municipality there is an existing water network close to the site. There are 3 reservoirs that services the town which are fed by boreholes and to date there has never been any shortages from this water source. The Hospital and Smook Street Reservoirs has a capacity of 950 KL and 5000 KL respectively and service the northern part of Zeerust. The Kop Street reservoir has a capacity of 7000 KL and services the southern part of Zeerust.

It is envisioned that this new development will tie in to the Kop Street reservoir water network. This reservoir is located approximately 3.7km south west of the site and is roughly 65m higher than the site which means that there is a static head of roughly 6 Bar. Due to the existing draw offs from this reservoir it is expected that the pressure will drop to just above 3 Bar.

There is a 150mm Ø water main running along Klip Street to the south of the site which then decreases to a 75mm Ø water main from Collin Street onwards. This 150mm Ø water main will have to be extended up Kloof Street and the 75mm Ø along Klip Street will need to be extended up to the site boundary to form a ring main.

Sewer Reticulation

The Zeerust Waste Water Treatment Plant (WWTP) is just to the north of the proposed development. A 450 mm HDPE sewer line bisects the site from south to north, crossing the Karee Spruit by means of a steel frame bridge into the sewer treatment plant.

At 70% percent of full capacity this sewer line can handle up to 285.9 l/s and estimated flows from existing infrastructure is roughly 116.9 l/s. There is enough capacity in this sewer line should the WWTP be upgraded and operating functionally.

This Sewer Treatment Plant is currently running at 184m³/h but is only 15% efficient due to maintenance constraints. Ngaka Modiri Molema District Municipality is to upgrade the plant from a 3.5ML to a 17 ML Treatment plan, and are at Tender stage. Once the treatment plant is upgraded it will have sufficient capacity to support the proposed development.

As the upgrades to the WWTP doesn't have a specified date, it is proposed that this development installs an onsite sewer package plant until such upgrades have been completed. This will require approval by the North West Department of Rural, Environment and Agricultural development and a water use licence from the Department of Water and Sanitation. The anticipated peak sewer discharge of the site is 3.034l/s which amounts to 262.1376 m³/d. The Sewer Package Plant will be designed to accommodate this discharge.

Traffic Statement

A traffic engineer, GMH/Tswelelo Consulting Engineers, has been appointed to produce and submit a Traffic Impact Assessment for this project.

All approved recommendations for any road or intersection upgrading will be addressed during the final township services design submissions by a registered consulting engineer.

Roads

There is a fully functional road network servicing the area accesses required from the N4 and Kloof street to the site. The N4 is currently being upgraded, and the upgrades through town should start in the near future.

Stormwater

There are functional stormwater systems around the site. As the site is situated between the Karee and Klein-Marico rivers it is envisioned to use Sustainable Urban Drainage Systems (SuDS) to manage stormwater runoff generated from the new development before being discharged into the natural water bodies.

A Stormwater Management Report will be submitted to council before any construction starts. Extraneous stormwater from the south will be accommodated over the site.



11.7.2 Internal Services

The design of the township services for the proposed township will be based on the principles contained in the Guidelines for the Provision of Engineering Services in Residential Townships published by the department of Community Development and the Councils requirements for engineering services.

Outline Scheme

The outline scheme is in accordance with the above standards and with officials from the Ramotshere Moiloa Local Municipality.

Water Reticulation

There is an existing 150mm Ø water main to the south west of the site in Klip Street which, should have sufficient supply for this application due to the fact that the area has not yet reached its full potential.

The anticipated total water demand = 0.89l/s + 0.550l/s + 0.069l/s + 0.038l/s + 0.103l/s = 1.651 l/s

Applying a peak of 4

Total peak flow = 6.604 l/s

$V=Q/A = 6.604 \text{ l/s } 150 \text{ mm } \text{Ø ID}$

17671.500 mm²

= 0.37370908 m/s

Adding in Fire Flow of 25 l/s

The total peak fire flow =31.604 l/s

$V=Q/A = 31.604 \text{ l/s } 150 \text{ mm } \text{Ø ID}$

17671.500 mm²

= 1.788416377 m/s

A 150mm Ø water main will be sufficient to service this proposed development.

The peak fire flow velocity is below the maximum of 3.5m/s specified therefore a 150mm Ø (ID) has sufficient capacity to service the proposed development.

As there is sufficient flow in the existing network an onsite reservoir will need to be erected and adequate firefighting points provided as per the Fire Consultants comments.

All water services will be designed to Local Authority specifications.

Sewer Reticulation

There is an existing 450mm Ø HDPE sewer line that bisects the site from south to north to where it discharges into the Zeerust Waste Water Treatment Plant just north of the site. This plant is in the process of being upgraded.

The anticipated sewer discharge:

Total demand = 0.713 l/s + 0.434 l/s + 0.056 l/s + 0.030 l/s + 0.086 l/s = 1.319 l/s

Applying a peak of 2.3

Total peak flow = 3.034 l/s which amounts to 262.1376 m³/d.

Internal reticulation on the site will be required. The development connection will be a 160mm Ø PVC-U sewer pipe to connect to the existing 450mm Ø HDPE existing sewer line bisecting the property.

All sewer services will be designed to Local Authority specifications.

Township Roads

This development is required to provide ingress and egress lanes from and to the N4 and Kloof Street. It is



envisaged to construct a double carriage link road from the N4 through the site to link up with Kloof Street, which will reduce traffic congestions through the main road (Church Street) of town. This will be provided at the time of final designs in accordance with the TIA and to Local and National Authority Specifications.

Township Stormwater

An internal stormwater system will be provided to drain the property and convey such runoff to the low points in the north eastern corner. As this site is located between two (2) natural rivers and approximately 1.2km before the Klein-Maricopoort dam it will not be necessary to do on site attenuation. However, it is proposed to make use of the Sustainable Urban Drainage System (SuDS) treatment train to manage the stormwater runoff before being discharged back into the natural water courses.

The following SuDS controls are to be investigated at the final design stage as per Local Authority Standards

Source Controls

- Green roofs are vegetated roofs (Wanielista et al., 2008; Stahre, 2006).
- Rainwater Harvesting refers to the temporary storage and reuse of rooftop and/or surface runoff (Melbourne Water Corporation, 1999).
- Soakaways are usually excavated pits that are packed with coarse aggregate and other porous media and are used to detain and infiltrate stormwater runoff from a single source.
- Permeable pavements comprise load-bearing, durable and pervious surfaces such as concrete block pavers (CBPs) laid on top of granular or stone base that can temporarily store stormwater runoff.

Local controls

- Filter strips are vegetated areas of land that are used to manage shallow overland stormwater runoff through filtration (Debo & Reese, 2003).
- Swales are shallow grass-lined channels with flat and sloped sides that are used to convey stormwater from one place to another. They typically remain dry between rainfall events (Mays, 2001; Parkinson & Mark, 2005).
- Infiltration trenches are excavated trenches which are lined with a geotextile and backfilled with rock or other relatively large granular material (Hobart City Council, 2006). They are typically designed to receive stormwater runoff from adjoining residential properties.
- Bio-retention areas are landscaped depressions used to manage stormwater runoff through several natural processes such as filtration, adsorption, biological uptake and sedimentation (Debo & Reese, 2003).
- Sand filters usually comprise of an underground sedimentation chamber connected to a filtration chamber in which stormwater runoff is temporarily stored before being filtered through a sand filter (Woods-Ballard et al., 2007).

Regional controls

- Detention ponds are relatively large depressions that temporarily store stormwater runoff in order to reduce the downstream flood peak (Woods-Ballard et al., 2007).
- Retention ponds also known as 'retention basins' – are formed by excavating below the natural ground water level and/or lining the base to retain stormwater runoff (Debo & Reese, 2003; Mays 2001).
- Constructed wetlands attempt to mimic the characteristics of natural wetlands through the use of marshy areas and aquatic-resilient plants (NCDWQ, 2007; Woods-Ballard et al., 2007). They can be aesthetically pleasing and provide a vibrant wildlife habitat.

Conclusions

The proposed development can be adequately serviced from the existing municipal infrastructure. Upgrades will have to be done to the water and roads network to the developers account. Sewer reticulation will be handled on site prior to the upgrades of the Waste water treatment plant.

All final designs for water, sewer, stormwater and roads will be submitted to council before any construction commences.



11.8 Waste Management

The collection of solid waste at the Autumn Leaf Shopping Mall should be carried out by the Local Municipality. If the Ramotshere Moiloa Local Municipality is not able to provide this service then a private company will be appointed by the management of the Autumn Leaf Mall for this purpose. A refuse area will be accommodated on site and waste will be disposed of at the municipal dumping site as per the requirements of the Municipal Health Bylaws.

11.9 Flood line Assessment

A flood line Assessment was conducted by Klunene Consulting Civil Engineers. Appendix G refers. The subject property is located between the Klein Marico River and the Karee Spruit and is therefore impacted by flood lines as indicated and endorsed by the relevant engineer on the Site Development Plan. The maximum discharges associated with the various return periods were calculated by means of the Rational Method, using the Adamson Method for the rainfall intensity estimation. The associated flood levels at various cross sections were modelled by means of HEC-RAS.

11.10 Traffic

A Traffic Impact Assessment was conducted by GMH/Tswelelo Consulting Engineers. Appendix G refers.

The following intersections form part of the Primary Study Area:

Intersection 1 (Church Street (N4) and Current Access)

Church Street (N4) is an undivided 2 lane National road with a Speed limit of 80km/h. There is an access to the north of the property. This access point allows for the required minimum sight distance of 300m and is located 1.3km from the nearest intersection to the West. There are no pedestrian walkways or public transport facilities around the intersection.

No intersection upgrades are required from a capacity point of view. It is however required that additional turning lanes be provided as per SANRAL's requirements.

Intersection 4 (Kloof Street and Future Secondary Access)

Kloof Street is an undivided 2 lane road with a speed limit of 60km/h. The location of the proposed access will allow for a sight distance of about 150m in both directions along Kloof Street.

No upgrades are required from a capacity point of view. It is however proposed that a 20m right and left turning lane be provided on the Southern and Northern approach respectively. This will improve overall mobility and safety along Kloof Street whilst improving the site access.

Site circulation and Parking

There is sufficient space and turning opportunities on site for delivery and refuse vehicles to ensure that there is adequate site circulation. The internal link road between the two access points will also provide additional mobility and accessibility to the town of Zeerust. The number of parking bays provided is 1618 parking bays and the design thereof complies with national parking design standards.

Proposed improvements

No upgrades are proposed for the intersections adjacent to the development's accesses. The construction of the proposed accesses should form part of the proposed development and should be in accordance with the proposed accesses in this document. Additional turning lanes should be provided at both accesses. The access from Kloof Street must comply with the requirements set out by the local municipality. The access from Church Street (N4) must comply with SANRAL standards. No further improvements to the current external road infrastructure are deemed necessary.

Conclusions and recommendations

The development has little to no impact on the surrounding network. The expected worst case scenario's Level-of-service (LOS) for all the intersections are considered as acceptable.



It is recommended that pedestrian walkways be provided on the property boundary where applicable. In light of this report it is recommended that from a traffic flow point of view the proposed developments should be approved.

12 IMPACT ASSESSMENT

The impacts that may result from the planning and design, construction, operational, decommissioning and closure phases as well as proposed management of identified impacts and proposed mitigation measures have been addressed in the Basic Assessment Report.

13 ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

An Environmental Management Programme was prepared to detail a plan of action to ensure that recommendations for preventing the negative environmental impacts (and where possible improving the environment) are implemented during the life-cycle of the project.

14 CONCLUSION

In summary the following is recommended for authorisation:

This EIA will seek to authorise the total property. The maps attached in Appendix A indicates/highlights the whole area that was investigated to inform DREAD on the area that is part of the authorisation. The wider area that was investigated will allow future potential amendments to the EA should it be necessary (at a later stage). Should small changes be done to the layout of the shopping mall after authorisation it will not be considered crucial and will not warrant a new application. In other words, small changes will be allowed e.g. the location of shops in the mall could change.

Table 8: Co-ordinates of the corners of the site (wider area) that is investigated

Description (4 corners of site)	Lat (DDMMSS)	Long (DDMMSS)
North East	25°32'32.44"S	26° 6'12.70"E
North West	25°32'48.92"S	26° 5'21.00"E
South East	25°32'44.80"S	26° 6'8.26"E
South West	25°32'52.92"S	26° 5'22.14"E

The EIA recommends Layout Preferred Alternative 1 for construction

The Preferred Layout Alternative 1 is recommended for the proposed development.
