



KANTEY & TEMPLER
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15 November 2023

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Cape Estates Properties Outeniqua Pty Ltd
PO Box 12486
Garden Route Mall
George
6546

Attention: Arno de Vos

E-Mail: arno@capeestates.co.za

Dear Sir

KRAIBOSCH RIDGE REZONING REMAINDER Erf 27668 GEORGE EIA INFORMATION – CIVIL WORKS: AVAILABILITY OF CIVIL SERVICES FOR PROPOSED DEVELOPMENT

On behalf of the developer, we have prepared a services report in support of a NEMA & Lupo process undertaken by the EIA Consultant on behalf of the developer. The different envisaged property uses have been divided into five phases - see attached Annexure A.

It is envisaged that the development will take place in five phases with Phase 1 and 2 of the development having been completed and the other phases (Phase 3 currently being constructed) to follow as future phases.

It is noted that current water and sewer rights are allocated to the development property.

Water Provision

Water demand for the proposed items with an average annual daily consumption calculated in accordance with the Red Book (Guidelines for Human Settlement Planning and Design as compiled by the CSIR) proposals and general sound practice is a total of 411 m³/day. This equates to a peak flow rate of 43.53 l/s. The accepted design norm is that 80% of potable water goes to sewage and the remainder is used for human consumption, gardening and other general uses. However, according to the Water Demand Management Plan gardens will be maintained using rainwater harvested on site.

George Municipality have confirmed that they do have sufficient raw water for the development. It is further noted that the supply of treated potable water needs to be managed due to limited resources. The development can be provided with an on-site connection – see Annexure B.

The developer will be responsible to connect to the existing municipal network which is in close proximity to the proposed development. No upgrade to the existing reticulation in the vicinity of the development is required, the installation of certain external bulk pipelines is however required and will form part of the development (max 200mm dia.) - see attached drawing G5155BD-CE-202. Capital Contributions payable by the developer will be taken into consideration for this.

Potable water will be reticulated to the individual sites through a below ground reticulation system consisting of uPVC pipes ranging from 75mm to 200mm dia. – see attached drawing G5155BD-CE-202 and G5155BD-CE-210.

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Water demand management measures that will be implemented include the compulsory installation of water tanks to collect water from building roofs. This water will be used for landscaping irrigation – refer to the Water Demand Management Plan as compiled by Others.

Sewage Disposal

The George municipality has indicated that they will have sufficient treatment capacity available when required - see attached Annexure B.

Based on the water demand the estimated sewage flow will be 329 m³/day. This equates to a peak flow rate of 11,22 l/s. The developer will be responsible to deliver sewage by gravity or by pumping to the existing outfall sewer which is in close proximity to the proposed development. No upgrade to the existing outfall sewer in the vicinity of the development is required – see attached drawing G5155BD-CE-202 and G5155BD-CE-210.

Road Access

Road access to Phase 1 and 2 is currently provided via the existing Groenkloof road (Road 2 as per the Kraaibosch Roads Masterplan and Cost Apportionment document (KRMCA)). This road is in the process of being upgraded (widened) to a Class 3 local distributor as per the KRMCA (by others). Further access will be provided by the construction of Road 3 (west of the Development) as per the KRMCA (connection onto Groenkloof road leading to the existing circle at the Kraaibosch Manor, extending to the Garden Route Mall intersection on Knysna Avenue) - see TIA done by others. These external master plan roads were the subject of a previous EIA process and the required ROD for their construction has been issued.

Access to the further development (future phases and area south of Road 5) will be gained from the future Road 3 as per the TIA done by Messers ITS Transportation Engineers. Intersections and traffic trip generation of connector roads onto the existing Knysna Avenue are the subject of this Traffic Impact Assessment (TIA).

The width of internal roads will vary between 4,5 and 5,5 meters and be built in 12m and 18m wide road reserves. The roads will have concrete block paving as the final wearing surface with gravel layerworks beneath.

Telecommunication Services

If the development elects to have a terrestrial telecom service, the developer will install cable ducts and junction boxes to all properties for the future installation of telecommunication cables by the supplier of choice. To minimize the environmental impact of the installation of the ducts, the ducts will follow the roads where possible or where this is not an option ducts will follow other services routes.

Wireless communication is also an option, in which event the ducts might not be required.

Stormwater Disposal and Management Plan

Stormwater infrastructure is envisaged to be provided by the developer – see drawing G5155BD-CE-202, G5155BD-CE-211 and G5155BD-CE-212. All necessary precautions will be taken to prevent erosion.

Design Philosophy

Stormwater management will be according to recommendations contained in the Red Book i.e. Guidelines for Human Settlement Planning and Design as compiled by the CSIR. The principals of SuDS will further be taken into account in order to minimise the amount and impact of stormwater leaving the site.

A dual drainage system will be adopted. Source control of the minor flood with 1:5 year or less recurrence intervals will be provided by the utilisation of roof water collection rainwater tanks to collect runoff from roofs for later use in irrigation of gardens etc. Local control will be facilitated

by the use of catchment structures and will, where possible, be constructed per erf pockets as required. This will to some extent facilitate infiltration of water at source.

The major flood with 1:50 year recurrence interval will be carried in the streets and the formal system (as per Guidelines) and only where the above minor system's capacity is exceeded, then in overland open or piped channels to the natural watercourses.

During the detail design phase, storm runoff from catchment areas will be calculated and catchpit inlets will be positioned and sized to match runoff volumes. The capacity of road kerbs will also be checked against major runoff volumes. Stormwater servitudes will be provided between erven where necessary to accommodate overland open channels with sufficient capacity to carry major storm runoff from the edge of the road to the nearest natural watercourse.

Specific Considerations

Runoff from the land will increase as a result of the development, but this will be accommodated in the design of the minor and major stormwater system. The increased runoff will not affect any existing or proposed properties, since all properties are well above the 1:100 year flood lines for all the natural watercourses (Modderkloof River).

Increased overland flow velocities

Various measures will be incorporated to mitigate increased flow velocities like:

- Energy dissipaters and stilling basins at stormwater pipe outlets. Reno mattress aprons with stilling basins where appropriate will be provided at all culvert outlets. Large rocks will be effective as energy dissipaters and will contribute to the landscaping.
- Lining of open channels with grass (swales) and or stone pitching where required.
- Utilisation of invader tree logs to act as flow speed calming structures placed across flow paths and anchored properly.
- Utilisation of Gabion type structures to act as flow speed calming elements placed across flow paths and anchored properly.

Quality of water

Long term contamination of stormwater run-off is not a concern as the development consists mostly of commercial and housing development. In line with the SuDS principals pipe culvert outlets will be provided with Gabion and Reno mattress structures to facilitate slowing of minor storm flows and to provide infiltration areas to augment subsurface flow. Possible pollutants will be trapped in these structures and can be cleaned out as part of a regular maintenance schedule.

The site is most vulnerable during the construction phase and it will be necessary to utilize silt screens and onion bags to trap silt before the run-off joins the natural watercourses. Once vegetation in all the disturbed areas of the development is well established and ground surfaces have consolidated, no further measures will be required. These measures will be the subject of the Environmental Management Plan (EMP) which will be issued to the contractor at construction stage. The Environmental Control Officer (ECO) will be responsible for enforcing the EMP.

Protection of slopes that occur on the property

Natural slopes that have been disturbed and where sheet flow occurs will be landscaped and re-vegetated. Where flow is concentrated, measures will be incorporated as proposed above.

Where stormwater is channelled towards the river and tributary streams, outlets have been spaced at intervals along the stream edge to avoid concentration of large flows.

Stormwater will thus be fed into the streams and river system along a wide front allowing dissipated flow and seepage to all areas.

Watercourse/River Crossings

Due to the site configuration and proposed access roads to the site it is required that certain streams be crossed. The road crossings have been identified and preliminary designs finalised - see drawing G5155BD-CE-202 and G5155BD-CE-212. The required Water Use Licence will be obtained from the Department of Water Affairs as per the EIA process.

The culvert crossings proposed will allow natural flows to pass through the structure. Sleeves will be allowed in the culvert deck so that future crossing of cables or pipes will have no further negative impacts.

Preliminary High level Flow Estimation

When referring to the attached layout drawing it can be seen that the layout and land usages have not been finalised in all instances yet. This is not uncommon as the development of various options and subsequent approvals have not been finalised yet. It is therefore not possible to, at this stage, execute detailed flow quantity calculations. The figures provided below should therefore be considered as estimated quantities only.

Flow estimation has been done according to the Rational Method for the 1:5 years return period nl. stormwater accommodated in the underground piped system (no influence on the wetlands as discharge is directly to the river) and stormwater channelled through the wetlands (minimised to minimise the potential effects) due to existing topography. Flow is further indicated for the west and east legs separately as follows.

Pre-development flows:

	West (l/s)	East (l/s)
- Channelled through the wetlands:	214.41	273.81

Post-development flows:

	West (l/s)	East (l/s)
- Channelled through the wetlands:	422.71	539.81

As can be seen the expected increase in flow is 208.30 l/s west and 266.00 l/s east.

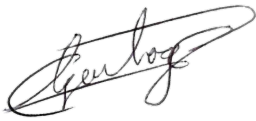
Solid Waste disposal

The Local Authority will dispose of the solid waste. Collection of the waste will be by mutual agreement between the Developer and the Local Authority.

Do not hesitate to contact us should you want to discuss anything further or if you require further information.

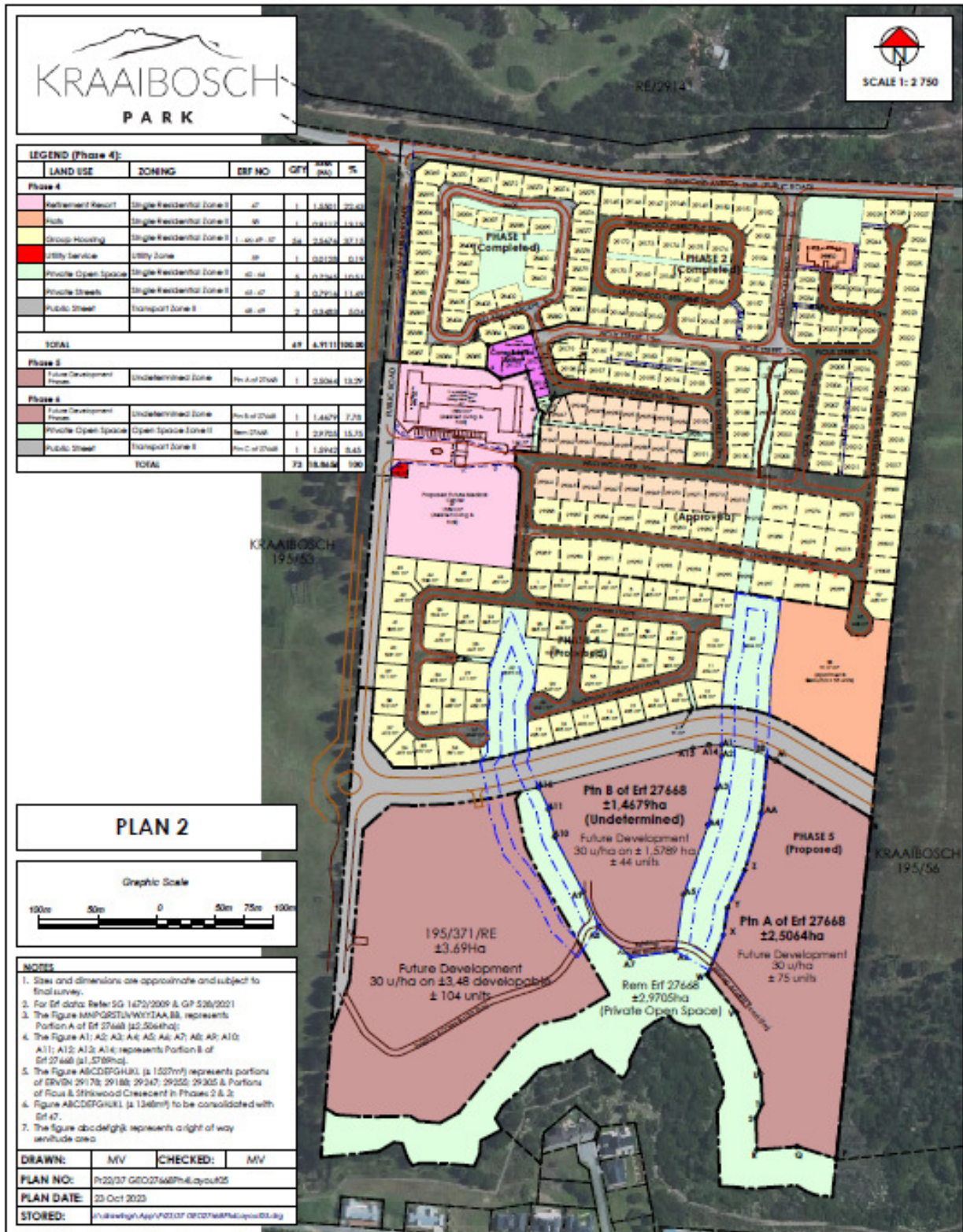
Yours faithfully

KANTEY & TEMPLER (Pty) Ltd

A handwritten signature in black ink, appearing to read 'C G AGENBAG', written in a cursive style.

C G AGENBAG Pr Eng

Annexure A – Kraaibosch Ridge Zoning and Usage



LEGEND (Phase 4):

LAND USE	ZONING	ERF NO	QTY	HAZ	%
Phase 4					
Retirement Resort	Single Residential Zone 1	47	1	1.6301	22.43
Flats	Single Residential Zone 1	56	1	2.0411	28.14
Group Housing	Single Residential Zone 1	1, 44, 47, 48	24	2.8424	39.13
Utility Service	Utility Zone	58	1	0.2213	3.03
Private Open Space	Single Residential Zone 1	42, 44	2	2.2244	30.57
Private Streets	Single Residential Zone 1	42, 47	2	0.2214	3.03
Public Street	Transport Zone B	48, 49	2	0.3482	4.76
TOTAL			47	6.9111	93.86
Phase 2					
Future Development	Undetermined Zone	Pre-C of 2768	1	0.0264	0.36
Phase 3					
Future Development	Undetermined Zone	Pre-C of 2768	1	1.6679	22.75
Private Open Space	Open Space Zone 1	Pre-C of 2768	1	2.2755	30.87
Public Street	Transport Zone B	Pre-C of 2768	1	1.2242	16.55
TOTAL			3	5.1676	69.73

PLAN 2

Graphic Scale

100m 50m 0 50m 75m 100m

NOTES

1. Sizes and dimensions are approximate and subject to final survey.
2. For Erf data Refer SG 1472/2009 & GP 526/2021
3. The Figure MNPQRSTUWVYZAA, BB, represents Portion A of Erf 27668 (±2.5064ha)
4. The Figure A1; A2; A3; A4; A5; A6; A7; A8; A9; A10; A11; A12; A13; A14; represents Portion B of Erf 27668 (±1.5789ha)
5. The Figure ABCDEFGHIJKL (± 1527m²) represents portions of ERVEN 29178; 29188; 29247; 29255; 29305 & Portions of Rous & Shikwood Crescent in Phases 2 & 3
6. Figure ABCDEFGHIJKL (± 1348m²) to be consolidated with Erf 47.
7. The figure abcdefghijkl represents a right of way servitude area

DRAWN: MV CHECKED: MV

PLAN NO: P22/07 GEO27668Ph4Layout05

PLAN DATE: 23 Oct 2023

STORED: \\ukwintg\apps\p22\07 GEO27668Ph4Layout05.dwg

**GEORGE REMAINDER
ERF 27668 (KRAAIBOSCH PARK)**

**PHASE 4
LAYOUT PLAN**

APPROVED IN TERMS OF SECTION 23(1) OF THE GEORGE MUNICIPALITY'S BY-LAW ON MUNICIPAL PLANNING AS PUBLISHED IN P.N. 8747/2023 ON 21 APRIL 2023.

MUNICIPAL MANAGER

DATE: _____

Marke Vreken

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Annexure B – Municipal Services Available



Enquiry: Mr Ricus Fivaz
Manager: Land Development Directorate:
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E-mail: jmfivaz@george.gov.za
Tel: +27 (0)44 801 9350

Reference number: 2590952
Date: 2 November 2023
Enquiries: R Fivaz
044 801 9268

ATTENTION: MS SONIA JORDAAN

Cape Estate Group
2 Cape Ash Close
Kraaibosch Park
George
6530

ERF 27668 & PORTION 371 OF 195, GEORGE: PROPOSED DEVELOPMENT

AVAILABILITY OF BULK WATER AND SEWER INFRASTRUCTURE

Your request dated 19 October 2023 to accommodate the proposed development in the George Municipal water and sewer system refers.

The George Municipality confirms that the proposed development was taken into consideration in the current water and sanitation master plans as part of the Kraaibosch development area and sufficient (network and treatment) capacity are available to accommodate the development.

Details regarding Development Contribution and the application their-off will be included in the Service level Agreement (SLA) addendums, as required in the original SLA.

As to water required for construction purposed, the Municipality confirm that sufficient metered portable water is be available for construction, however, do to the current water restriction, developers are required to make use of purified water available from the varies Wastewater Treatment Plants. All cost in this regard will be for the developer's account.

Yours faithfully,

JANNIE KOEGELENBERG
DIRECTOR: CIVIL ENGINEERING SERVICES

Drawings:

G5155BD-CE-202
G5155BD-CE-210
G5155BD-CE-211
G5155BD-CE-212