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**WATER VIEW VILLAS
DEVELOPMENT OF ERF 3
Circular Drive, Knysna**

**CIVIL ENGINEERING
SERVICES REPORT
(WATER, SEWER & STORM WATER)**

**APRIL 2026
[N26/36]**

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1. INTRODUCTION

Nieuwoudt & Co has been appointed to investigate and report on the impact that the proposed cottages will have on the existing civil engineering services.

The applicant proposes to construct three cottages on the property and intending to use these for self-catering accommodation. Drawing K3CP.1 – Site Development Plan, included as Annexure E, provides a detailed illustration of the proposed development.

This report assesses the capacity and suitability of the existing water supply, sewerage and stormwater systems to accommodate the proposed cottages.

2. SCOPE

The scope of this report is to assess the provision of water supply, sewage disposal and stormwater management services for the proposed cottages in addition to existing dwelling on Erf 3.

3. GENERAL

The property is situated at 3 Circular Drive, Paradise, Knysna. It comprises of an existing dwelling converted into three self-catering cottages, existing outbuilding and existing double garage.

Bulk water and sewer services are provided to the property by Knysna Municipality (KM). The internal water and sewer reticulation systems are privately owned and maintained by the property owner. Stormwater is managed on the property.

The Neighbourhood Planning and Design Guide (commonly referred to as the “Red Book”) has been used to determine water and sewer demands.

Reference should be made to Drawings N26/36-1 and N26/36-2, included in Annexure A and B, which illustrates the existing water, sewer and storm water services relevant to the existing stand.

4. WATER SUPPLY

4.1 Bulk Water Supply

The property is supplied with potable water via an existing 75mm diameter municipal water main located in circular drive.

The internal reticulation downstream of the municipal water meter forms part of the private infrastructure owned by the property owner.

Representatives of Knysna Municipality have confirmed that the municipal water supply network can accommodate the additional demand generated by the proposed development.

4.2 Internal Reticulation

The pipeline servicing within the property is comprised of 27 mm diameter HDPE pipes.

The homeowner confirmed that there are no persistent pressure or flow-related issues within the property, aside from occasional maintenance-related matters.

A basic field test conducted at a nearby garden standpipe recorded:

- Static pressure: ± 7.5 bar
- Flow rate: ± 1.0 L/s
- Residual pressure under flow conditions: ± 4.0 bar

It is noted that although this standpipe is supplied via a small-diameter service pipe, it therefore represents a conservative assessment. Nevertheless, the observed conditions indicate adequate capacity to serve the proposed development of the property.

The property is located within 90 m (straight-line distance) of a municipal fire hydrant in Circular Drive. Accordingly, an additional hydrant is not required.

It is proposed that the new cottages connect to the existing 27 mm internal water main close to the existing dwelling.

4.3 Water Demand

The calculated **Annual Average Daily Demand** (AADD) for the proposed development is **0.31 kL/day** (refer Annexure C). This is less than the typical.

According to the "Red Book" (Part II, Table J.2) a single low-density erf (erf size 1,000 to 1,600m² - this erf is 1,586m²) has an AADD of 1.0 to 1.6 kL/day. Being on the higher side (1,586m² vs 1,600m²) a fair allowance would be **1.5 kL/day** which is substantially higher than the additional demand of the proposed development (0.31 kL/day).

Consequently, the demand of the proposed development combined with the existing use of the property is lower than the allowable demand for the erf.

4.4 Water Flow Rate

The estimated additional peak flow is **0.014 L/s** (refer Annexure C). This represents a conservative assessment, as actual demand will be diversified within the broader development and the surrounding neighbourhood.

Based on the allowable AADD of the whole erf (ref 4.3 above) the peak flow rate for the entire erf would be **0.069 L/s** ($1,500/86400 \times 4.0$ PF = 0.069).

The measured on-site flow rate of approximately 1.00 L/s at a nearby standpipe is significantly greater than the calculated additional peak flow of 0.014 L/s and the allowable peak flow of 0.069 L/s. This indicates that the existing internal reticulation and municipal supply can accommodate the proposed development.

Based on site observations and measured flow rates, the existing internal and municipal infrastructure are considered adequate to accommodate the additional demand.

4.5 Fire Flow Rate

As the existing hydrant services the property and was installed under municipal approval, it is assumed to comply with applicable fire protection requirements.

Given the limited additional demand imposed by the proposed development, it is unlikely to adversely affect fire-fighting capacity.

5. SEWAGE DISPOSAL

5.1 Bulk Sewer Infrastructure

Bulk sewer services are provided by Knysna Municipality and consist of a gravity sewer main running east to west across the southern portion of the site. This main discharges into a downstream pump station, which conveys effluent to the municipal wastewater treatment works (WWTW).

Municipal representatives have confirmed that the bulk sewer network and WWTW have sufficient capacity to accommodate the additional demand.

5.2 Internal Reticulation

The pipeline serving Erf 3 is a 110 mm diameter sewer running along the eastern boundary of the erven. This pipeline then discharges directly into the municipal gravity main via an erf connection manhole situated at the South-eastern corner of the property.

It is proposed to connect the development to the existing 110 mm sewer pipeline using a 110 mm diameter uPVC sewer pipe at a minimum gradient of 1.25%.

5.3 Sewer Demand

Sewer demand is typically estimated as a percentage of water demand. While guidelines suggest 85% to 90% for residential developments, a conservative value of 100% has been adopted.

Accordingly, the Average Dry Weather Flow (ADWF) is estimated at **0.31 kL/day** (refer Annexure D).

5.4 Sewage Flow Rate

Based on the proposed development in isolation, the following flows have been calculated (refer Annexure D):

- **Peak Dry Weather Flow (PDWF): 0.013 L/s**
- **Peak Wet Weather Flow (PWWF): 0.027 L/s**

Based on the concept applied in 4.4 above, the whole erf is estimated to generate a peak wet weather flow of **0.066 L/s** ($1,500/86400 \times 3.8 \text{ PF} = 0.066$).

A 110 mm uPVC sewer pipe at a gradient of 2% has an approximate capacity of **+/- 5.4 L/s**. The actual gradient is estimated to be in the order of 5% to 10%, resulting in significantly greater capacity. This capacity exceeds the maximum proposed flow (0.066 L/s). Accordingly, the existing sewer network is adequate to accommodate the proposed development.

6. STORMWATER

6.1 Stormwater System

Stormwater within the property is primarily conveyed via surface drainage.

Roof runoff is collected in rainwater storage tanks and is circulated back into the existing dwelling to supplement the municipal water supply. The overflow from the tanks discharge to ground level and is directed towards adjacent gardens. Surface runoff from landscaped and paved areas similarly drains towards the garden areas. This system equates to a low level of onsite attenuation.

6.2 Impact of Proposed Cottages on Stormwater System

Development of the three proposed cottages will result in an increase in both the volume and rate of stormwater discharge.

6.3 Proposed Stormwater System for Development

Stormwater from the proposed cottages will be managed in the same manner as the existing dwelling. Roof runoff will be collected in rainwater storage tanks and circulated back into the buildings. The overflow from the tanks will discharge at ground level and be directed towards the garden areas. Here too this equates to a low level of onsite attenuation.

7. SUMMARY AND CONCLUSION

The proposal is to construct three cottages in addition to the existing buildings on Erf 3.

Knysna Municipality has confirmed that the existing municipal water and sewer infrastructure has sufficient capacity to accommodate the additional demand. The internal services on the property are similarly adequate.

The proposed development will have a negligible impact on the existing stormwater system, as they will be doing a level of onsite attenuation, and does not necessitate system upgrades.

The existing connection points for water, sewer and storm water services are indicated in Annexure A & B.

Based on the investigations and assessments undertaken, there is no engineering services-related reason why the proposed development should not proceed.

We trust that this report adequately addresses the relevant aspects of the proposed development. We remain available to provide further input should this be required.



Tony Liebold PrTechEng
ECSA Registration No.: 200570017



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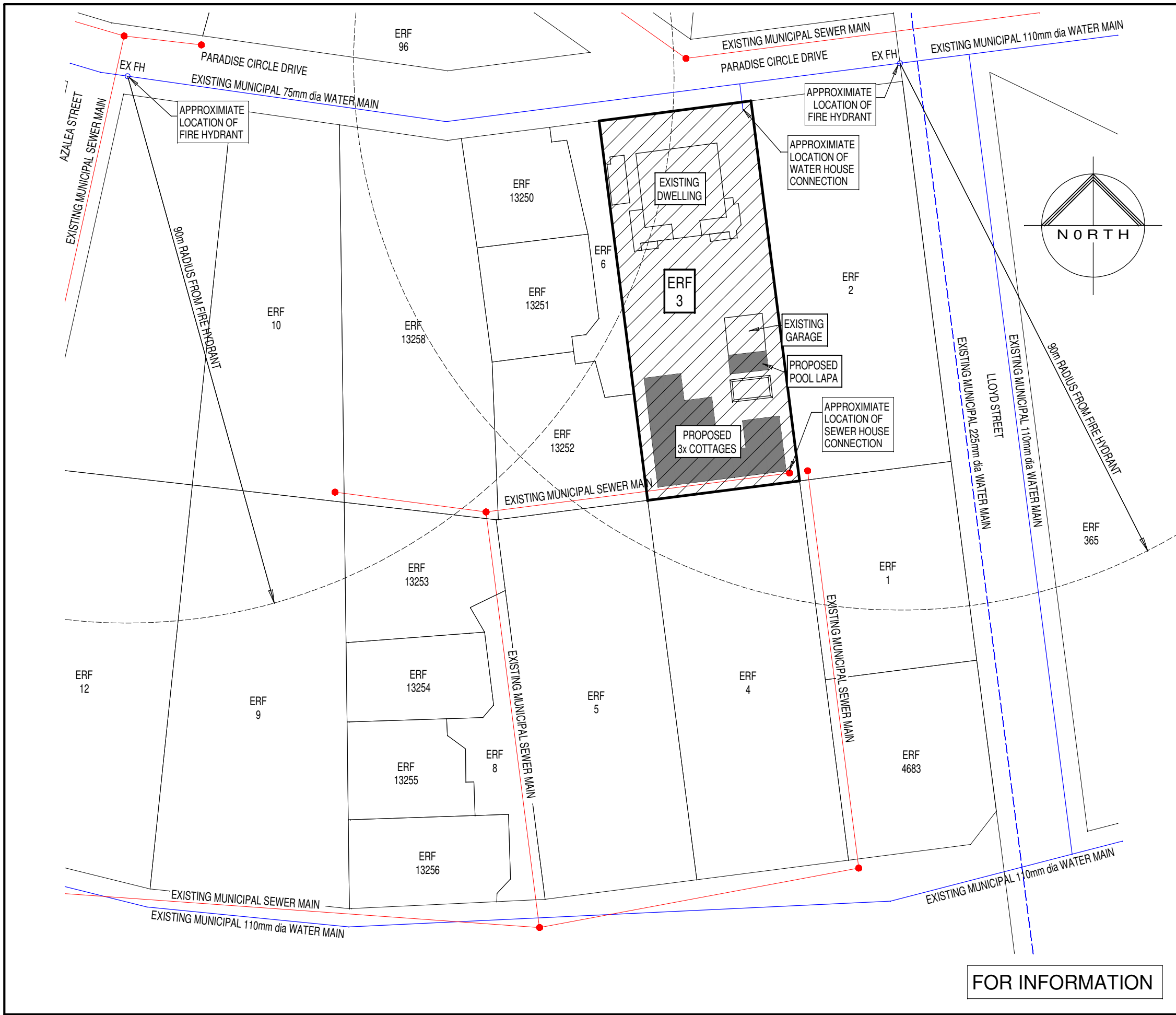
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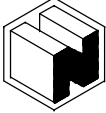
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ANNEXURE A

Drawing N26/36-1

Schematic Layout of Existing Water and Sewer Services



PROJECT			WATER VIEW VILLAS ERF 3, CIRCULAR DRIVE KNYSNA, 6571		
CLIENT			WATER VIEW VILLAS email: smart@smartsa.co.za		
TITLE			SCHEMATIC LAYOUT OF EXISTING WATER AND SEWER SERVICES		
ENGINEERS			 NIEUWOUDT & KIE 3 TROTTER STREET KNYSNA tel: 044-382 6882 6571 fax: 086-548 7588 e-mail : admin@nieu.co.za		
DATE		REVISION		DRAWING NO	
13/04/2026		0		N26/36-1	

ANNEXURE B

Drawing N26/36-2

Schematic Layout of Existing Storm Water Services

ANNEXURE C

Water Demand Calculations

Project: **Water View Villas - Erf 3, Circular Drive, Knysna**
 Subject: **Water Demand Calculations**

Water Demand Calculations - Annual Average Daily Demand (AADD)					
Source	Area (m ²)	Water Demand (L/day)		Total AADD (L/day)	
Water View Villas					
On-Peak Demands:					
Hotels, Guest Houses, Lodges,	177,1	0,9	per m2	159,39	* Table J.4
Boarding Houses, Retirement Centres & Villages	162,0	0,9	per m2	145,80	* Table J.4
				305,19	
Annual Average Daily Demand (AADD)				305,19	
				0,31 kL/day	

* Neighbourhood Planning & Design Guide - Part II

Water Demand Calculations - Peak Factors			
Source	Total AADD (L/day)	Total AADD (kL/day)	
Average Daily Flow Rate (Residential RES)	305,19	0,31	
Peak Hour Demand (PF)		4,00	* Table J.9

* Neighbourhood Planning & Design Guide - Part II

Water Demand Calculations - Peak Demand		
Source	Total AADD (L/day)	Total AADD (L/s)
Water View Villas		
On-Peak Demands:	305,19	0,004
Annual Average Daily Demand (AADD)		0,004 L/s
Peak Hour Demand		0,014 L/s

ANNEXURE D

Sewer Demand Calculations

Project: **Water View Villas - Erf 3, Circular Drive, Knysna**
 Subject: **Sanitation Demand Calculations**

FLows

Design Guidelines				
Development Category	Socio-economic / Income Group	People / Erf	Harmon Peak Factor Maximum	PWWF / Erf (l/s/e)
1	High	4,8	3,8	0,0660
2	Medium	4,5	3,8	0,0550
3	Low	5,5	3,8	0,0484
4	Town House & Group Housing	3,5	3,8	0,0350
5	Site & Service / Formal Development	6,5	3,8	0,0462
6	Informal Structures	6,5	3,8	0,0352
7	General (Dry) Industrial	10	3,8	0,5718

* Note that all commercial zoning are excluded from the flow calculations as they are considered to contribute flow during off-peak periods.

Typically Sewer Flow as % of AADD of Water Demand	85% to 90%	* Table K.4
This is close to 100%, so use 100%	100%	

** Neighbourhood Planning & Design Guide - Part II*

Erven		
Property	Socio-economic / Income Group	Units
Water View Villas	Hotels, Guest Houses, Lodges, Boarding Houses, Retirement	6
		6

No.

No.

Gravity Outfall Sewer Inflows to Pump Stations		
Water View Villas		
Proposed Cottages	3	No.
Existing Cottages	3	No.
Population	21	No.
Average Dry Weather Flow - ADWF	305,19	l/d
ADWF	0,004	l/s
Harmon Peak Factor	3,80	Max of 3.8
Peak Dry Weather Flow - PDWF	0,013	l/s
Peak Wet Weather Flow - PWWF (PDWF x 2)	0,027	l/s

ANNEXURE E

Drawing K3CP.1

Site Development Plan

