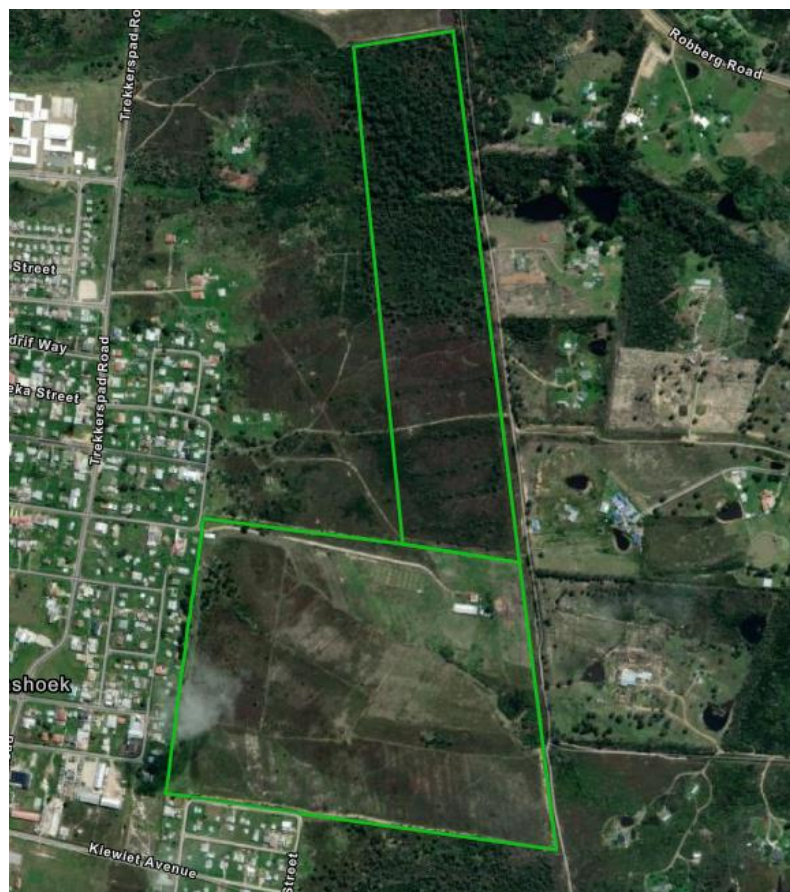


Civil Service Overview

Proposed Development on Portions 7 & 8 of Farm 432, Kranshoek

Report Nr. F19047r001



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Contents

TABLE OF FIGURES.....	4
LIST OF TABLES.....	4
1. INTRODUCTION	5
2. DEVELOPMENT OVERVIEW.....	5
2.1. Site Description	5
2.2. Proposed development	6
3. ENGINEERING SERVICES.....	7
3.1. Specifications and design guidelines	7
3.2. Roads.....	7
3.3. Stormwater.....	7
3.4. Water	9
3.5. Sewer	10
3.6. Electrical	11
3.7. Telecommunications	11
3.8. Refuse collection	11
3.9. Development charges.....	11
ANNEXURE A	12

Table of Figures

Photo 1 : Site Layout	5
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List of Tables

Table 1: Stormwater discharge.....	8
Table 2: Water Demand	9
Table 3: Sewer Demand	10

1. INTRODUCTION

Frame Group (Pty) Ltd was requested by PROPCAN (Pty) Ltd to give an overview of the proposed development on portions 8 and 9 of Farm 432 and make recommendations with regard to civil services.

The proposed development falls within the jurisdiction of Bitou Municipality. This report is intended to aid the town planner in planning for the development, taking into account the civil services required for the proposed development.

2. DEVELOPMENT OVERVIEW

2.1. Site Description



Photo 1 : Site Layout

Locality

The site has a general fall in a Southeastern direction. There is a demarcated green zone at the Eastern boundary of portion 7 and another at the Northern boundary of portion 8.

Portion 7 of Farm 432 is bounded by the following:

- Western boundary – Portion 9 of Farm 432 (which is in the process of being developed)
- Northern boundary – Egg farm
- Eastern boundary – Rural developed area
- Southern boundary – Portion 8 of Farm 432

Portion 8 of Farm 432 is bounded by the following:

- Western boundary – Urban developed area
- Northern boundary – Portions 7 and 9
- Eastern boundary – Rural developed area
- Southern boundary – Urban and rural developed areas

Geotechnical

A geotechnical investigation was done on portion 9 of Farm 432 and it is assumed, for planning purposes, that the soil profiles of portion 7 and 8 will be similar. It is therefore expected that the site most likely consist of:

- Clayey silty sand from 0 to 300mm with plant roots up to 200mm deep.
- Sandy clayey silt to silty clayey soils is found from 300mm to 1 400mm deep.
- Below this layer, a 150mm to 500mm thick pebble marker calcrete/ ferricrete layer is present. This layer is typically found between 1 000 mm and 1 600 mm deep.
- The soil found below the pebble marker layer is a stiff to very stiff sandy clay-silt. No bedrock was encountered.

2.2. Proposed development

As per Annexure B, portion 7 of Farm 432 is divided into 4 phases and portion 8 into 2 phases consisting of:

- Single residential zone 1 (841)
- Business zone 1 (1)
- Community zone 1 (3)
- Community zone 2 (4)
- Open space zone 1 (1)
- Open space zone 2 (5)
- Transport zone 2 (4)
- Transport zone 3 (6)

3. ENGINEERING SERVICES

3.1. Specifications and design guidelines

The local authority, Bitou Municipality, has special design requirements and criteria over-and-above that which is provided in the following guidelines:

- The "New Red Book" - Guidelines for Human Settlement Planning and Design.
- UTG - Urban Transport Guidelines.
- SARTSM - South African Road Traffic Signs Manual.
- SABS/ SANS 2001 - South African Bureau of Standards/ South African National Standards
- TRH17 - Geometric design of rural roads
- Storm water Management - Storm water Management Planning and Design for New Developments

3.2. Roads

There are several informal roads on both portions and one gravel access road along the Northern boundary of the property. Access to the properties is from Oos Street to the West of portion 7.

The proposed development will require the construction of new private and public roads. The public roads will be constructed at the cost of the developer and be transferred to Bitou municipality. The first proposed public road will be in an East-West direction and tie into Oos Street and terminate at the Eastern boundary of portion 7 for future extension. The second public road will gain access from the first road at its Northern most end and run in a North-South direction. It will terminate at the Southern boundary of portion 7. The 4 phases of portion 7 are proposed to gain access from the second public road. The private roads on the development on portion 8 will gain access from Stella Road on portion 9.

The entrance to each development is 15m wide with splays. The internal road reserves are 10m wide with 6m wide local accesses servicing one to three properties each.

It is proposed that a traffic impact assessment should be undertaken to determine the impact of the proposed development on the existing road infrastructure, analyse proposed intersections, roads and other infrastructure and recommend any required upgrades to existing infrastructure.

3.3. Stormwater

The sites are located in a region with a MAP of 1030mm. Farm 7/432 has a natural low point at the wetland located midway at its Eastern boundary. The site has a natural fall towards this wetland. Farm 8/432 has a high point midway at its Western boundary with a fall to the Northeastern and to the Southeastern direction from this point.

The pre- and post-development stormwater discharge and required attenuation for the two portions can be seen in Table 1 and Table 2 below:

Table 1: Stormwater discharge for farm 7/432

Pre Development						
Return period:	1:2	1:5	1:10	1:20	1:50	1:100
Flow (m ³ /s):	1,612	2,342	3,149	4,117	5,649	7,318
Post Development						
Return period:	1:2	1:5	1:10	1:20	1:50	1:100
Flow (m ³ /s):	2,338	3,183	4,029	4,974	6,466	7,958
Attenuation required						
Return period:	1:2	1:5	1:10	1:20	1:50	1:100
Volume (m ³):	652,891	757,314	791,756	771,649	735,568	575,990

Table 2: Stormwater discharge for farm 8/432

Pre Development						
Return period:	1:2	1:5	1:10	1:20	1:50	1:100
Flow (m ³ /s):	0,654	0,944	1,262	1,642	2,243	2,895
Post Development						
Return period:	1:2	1:5	1:10	1:20	1:50	1:100
Flow (m ³ /s):	0,851	1,177	1,512	1,895	2,501	3,123
Attenuation required						
Return period:	1:2	1:5	1:10	1:20	1:50	1:100
Volume (m ³):	177,770	210,056	225,334	228,168	231,590	204,999

For new developments, it is required to attenuate stormwater to allow a discharge that does not exceed the flow from the site prior to development. The attenuation ponds are proposed in the areas denoted "Pond 1" and "Pond 2" on the Site Development plan *23010_PLE 14 revision 7*, with title *Proposed Subdivision & Rezoning of Portion 7 & Portion 8 of the Farm Kranshoek No. 432, Knysna Road*. From the above tables, Pond 1 and 2 will be required to attenuate 967 kl.

The outflow and overflow of both ponds will be into the wetlands area located between them on Farm 7/432. The stormwater from Farm 8/432 will be channelled along a minor system and overland via roads (major system) towards the Southeastern corner of Farm 8/432. A culvert will be implemented starting from the development, passing beneath Le Fleur Road, and extending through Farm 7/432 along its easternmost road toward pond 1. This culvert will be designed to accommodate the 1:50 year post development flood. Farm 7/432 will channel stormwater along a minor system and along the road network towards the two ponds.

3.4. Water

The water demand calculations are based on the Guidelines for human Settlement Planning and Design (Red Book). The water demand summary for the proposed development can be seen in Tables 2 and 3:

Table 2: Farm 7/432 – Water Demand

Land use		Erf.	Category	Quantity		Water Demand						
						Water Demand AADD		Real Losses	PF	Peak hour Demand		Fire Demand
				Amount	Unit	kL/unit/day	kL/day	15%		kl/day	L/s	L/s
PHASE 1	General residential Zone GR.Z.I	163	Domestic Fire	163	units	0,3	48,9	7,34	3,6	202,45	2,34	25
	Business Zone B.Z.III	1	Domestic Fire	0,34624	ha	21	7,27104	1,09	3,3	27,59	0,32	25
	Community Zone C.Z.II	1	Domestic Fire	0,2517	ha	20	5,034	0,76	3,3	19,10	0,22	15
	Open Space Zone O.S.Z.II	1	Irrigation Fire	0,6387	ha	12	7,6644	1,15	2,0	17,63	0,20	0
	General residential Zone GR.Z.I	134	Domestic Fire	134	units	0,3	40,2	6,03	3,6	166,43	1,93	25
PHASE 2	Community Zone C.Z.I	1	Domestic Fire	98	student	0,06	5,88	0,88	3,3	22,31	0,26	15
	Community Zone C.Z.II	1	Domestic Fire	0,1869	ha	20	3,738	0,56	3,3	14,19	0,16	15
	Open Space Zone O.S.Z.II	1	Irrigation Fire	0,2372	ha	12	2,8464	0,43	2,0	6,55	0,08	0
	General residential Zone GR.Z.I	158	Domestic Fire	158	units	0,3	47,4	7,11	3,6	196,24	2,27	25
PHASE 3	Open Space Zone O.S.Z.II	1	Irrigation Fire	0,2372	ha	12	2,8464	0,43	2,0	6,55	0,08	0
	General residential Zone GR.Z.I	184	Domestic Fire	184	units	0,3	55,2	8,28	3,6	228,53	2,65	25
PHASE 4	Community Zone C.Z.I	1	Domestic Fire	120	student	0,06	7,2	1,08	3,3	27,32	0,32	15
	Utility Zone U.Z.	1	Domestic Fire	1	units	0,6	0,6	0,09	3,6	2,48	0,03	15
	Open Space Zone O.S.Z.II	4	Irrigation Fire	1,0127	ha	12	12,1524	1,82	2,0	27,95	0,32	0
	Total									965,32	11,17	

Table 3: Farm 8/432 – Water Demand

Land use		Erf.	Category	Quantity		Water Demand						
						Water Demand AADD		Real Losses	PF	Peak hour Demand		Fire Demand
				Amount	Unit	kL/unit/day	kL/day	15%		kl/day	L/s	L/s
PHASE 1	General residential Zone G.R.Z.I	72	Domestic	72	units	0,3	21,6	3,24	3,6	89,42	1,04	
			Fire									25
	Community Zone C.Z.I	1	Domestic	84,125	Students	0,06	50,475	7,57	3,3	191,55	2,22	
			Fire									15
	Open Space Zone O.S.Z.I	1	Irrigation	1,7147	ha	12	20,5764	3,09	2,0	47,33	0,55	
PHASE 2			Fire									0
	Open Space Zone O.S.Z.II	1	Irrigation	3,068	ha	12	36,816	5,52	2,0	84,68	0,98	
			Fire									0
	General residential Zone G.R.Z.I	96	Domestic	96	units	0,3	28,8	4,32	3,6	119,23	1,38	
			Fire									25
	Open Space Zone O.S.Z.II	1	Irrigation	0,2624	ha	12	3,1488	0,47	2,0	7,24	0,08	
			Fire									0
	Total									539,45	6,24	

The average annual daily water demand and peak flows for each phase are presented in Tables 1 and 2 above. The following assumptions were made for the calculation of these demands:

- The SDP drawing *23010_PLE 14 revision 7* was used to determine the land uses of the development.
- Places of institution are assumed to have 1 student per 10m² for Farm 7/432 and 1 student per 25m² for Farm 8/432.
- The protected areas zoned as open spaces are considered not to contribute to water demand.

- d. The utility zone allocated for the sewer pumpstation will have the same water demand as a single residential unit.

New water infrastructure will be required to service the various phases of Farms 7/432 and 8/432. A municipal pipeline will be installed in Le Fleur and Stella Roads with 6 separate metered connections, one for each phase.

Currently there is no information available regarding the existing services or water capacity. A global analysis should be performed by Bitou or GLS to determine the capacity of existing infrastructure and upgrades that may be required.

The water network is proposed to connect to the existing water network towards the West of the proposed development. A GLS report will be required to confirm the water network capacity, connection points and any possible upgrades required on the sewer infrastructure of Bitou Municipality.

3.5. Sewer

The sewer from Farms 7/432 and 8/432 will discharge into one pumpstation at the Eastern boundary of Farm 7/432. The pumpstation will be located on the designated utility zone erf. Below is a table summary of the expected sewer flows.

Table 3: Sewer Demand

Land Use	Quantity		Sewer Demand						
	Amount	Unit	ADDWF kL/unit/ day	PDDWF kL/day	IPDWF L/unit/s	L/s	GW L/s	SW L/s	IPWWF L/s
General residential Zone G.R.Z.I	807	units	0,29	310,46	0,005	3,650	0,56	0,6315	4,841
Business Zone B.Z.III	43,28	100m ²	0,52	130,92	0,010	0,435	0,0024	0,0656	0,503
Community Zone C.Z.I	76,006	100m ²	0,39	464,35	0,105	7,987	0,02	8,6037	65,962
Community Zone C.Z.II	43,86	100m ²	0,48	104,48	0,009	0,407	0,025	0,0647	0,496
Open Space Zone O.S.Z.I	171,47	100m ²	0	0,00	0,000	0	0	0	0
Open Space Zone O.S.Z.II	653,83	100m ²	0	0,00	0,000	0	0	0	0
Utility Zone U.Z.	2,36	100m ²	0	0,00	0,000	0	0	0	0
Total			1,68	905,73	0,12	12,07	0,58	9,30	71,31

A gravity sewer network on farm 8/432 will collect sewer from all the erven on this farm. This sewer network will accumulate into a single pipe at the Southern boundary where it will exit between plots 105 and 106 on Farm 8/432 and cross Le Fleur Road entering Farm 7/432, between plots 206 and 207. This portion of the sewer pipe on farm 7/432 will be a shared sewer pipe between farm 8/432 and 7/432 and should be routed along the roads of Farm 7/432 and through the open space O.S.Z.II. It will cross the open space from between plots 229 and 230 to between plots 296 and 297. From here the sewer will be routed to the pump station along the development roads.

The sewer pump station is proposed to discharge into the sewer network towards the Western direction of the proposed development. A GLS report will be required to confirm the sewer network capacity, connection points and any possible upgrades required on the sewer infrastructure of Bitou Municipality.

3.6. Electrical

Discussed in separate report.

3.7. Telecommunications

There is no information at this time.

3.8. Refuse collection

The Department of Solid Waste Management will collect solid waste at the entrance to each development phase.

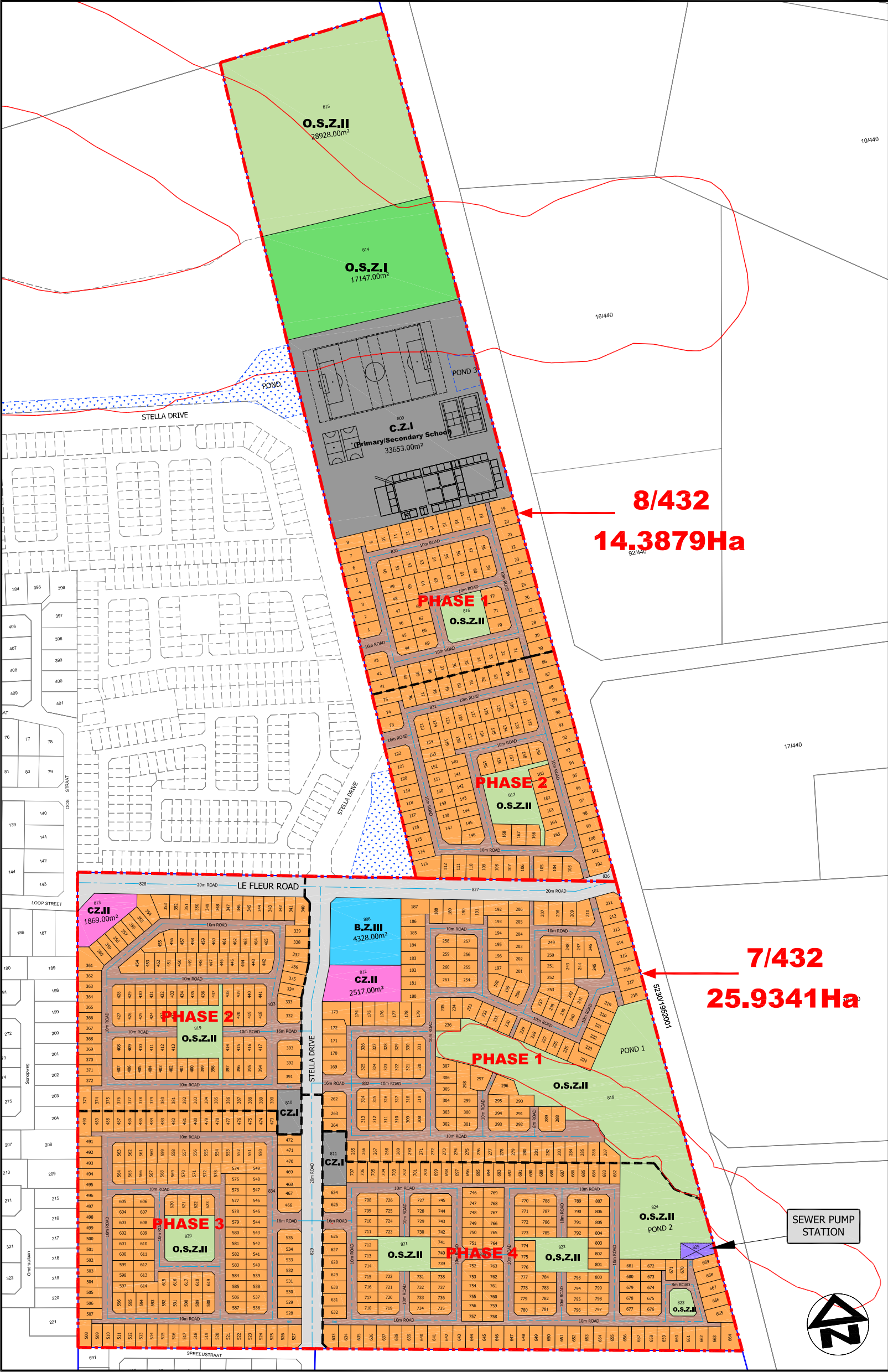
3.9. Development charges

Development charges for the proposed development to be calculated and approved by Bitou Municipality. The development charges should be determined separately for each phase.

ANNEXURE A

*Site Development plan 23010_PLE 14 revision 7 with title Proposed Subdivision & Rezoning
of Portion 7 & Portion 8 of the Farm Kranshoek No. 432, Knysna Road*

Proposed Subdivision & Rezoning of Portion 7 & Portion 8 of the Farm Kranshoek No. 432, Knysna Road



PORTION 7 PHASING

PHASE 1 (G.P - 03)	No.Units	Area in m ²	% Allo
General Residential Zone I	163	41574.00m ²	45.75%
Business Zone III	1	4328.00m ²	4.76%
Community Zone II	1	2517.00m ²	2.77%
Open Space Zone II	1	18823.00m ²	20.72%
Transport Zone II	1	9809.00m ²	10.79%
Transport Zone III	1	13818.00m ²	15.21%
Total	168	90869.00m²	100.00%

Average Residential Erf Size: 255.05m²

PHASE 2 (G.P - 04)	No.Units	Area in m ²	% Allo
General Residential Zone I	134	30623.00m ²	61.74%
Community Zone I	1	979.00m ²	1.97%
Community Zone II	1	1869.00m ²	3.77%
Open Space Zone II	1	2372.00m ²	4.78%
Transport Zone II	1	4487.00m ²	9.05%
Transport Zone III	1	9273.00m ²	18.69%
Total	139	49603.00m²	100.00%

Average Residential Erf Size: 228.53m²

PHASE 3 (G.P - 05)	No.Units	Area in m ²	% Allo
General Residential Zone I	158	35079.00m ²	66.37%
Open Space Zone II	1	2088.00m ²	3.95%
Transport Zone II	1	4884.00m ²	9.24%
Transport Zone III	1	10804.00m ²	20.44%
Total	161	52855.00m²	100.00%

Average Residential Erf Size: 221.89m²

PHASE 4 (G.P - 06)	No.Units	Area in m ²	% Allo
General Residential Zone I	184	41624.00m ²	63.05%
Community Zone I	1	1196.00m ²	1.81%
Open Space Zone II	4	10235.00m ²	15.50%
Utility Zone	1	452.00m ²	0.69%
Transport Zone III	1	12507.00m ²	18.95%
Total	191	66014.00m²	100.00%

Average Residential Erf Size: 226.22m²

Grand Total of Portion 7	659	259341.00m ²	100.00%
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PORTION 8 PHASING

PHASE 1 (G.P - 01)	No.Units	Area in m ²	% Allo
General Residential Zone I	72	18972.00m ²	17.77%
Community Zone I	1	33653.00m ²	31.51%
Open Space Zone I	1	17147.00m ²	16.06%
Open Space Zone II	2	30680.00m ²	28.73%
Transport Zone III	1	6331.00m ²	5.93%
Total	77	106783.00m²	100.00%

Average Residential Erf Size: 263.50m²

PHASE 2 (G.P - 02)	No.Units	Area in m ²	% Allo
General Residential Zone I	96	26133.00m ²	70.45%
Open Space Zone II	1	2624.00m ²	7.07%
Transport Zone II	1	221.00m ²	0.60%
Transport Zone III	1	8118.00m ²	21.88%
Total	99	37096.00m²	100.00%

Average Residential Erf Size: 272.22m²

Grand Total of Portion 8	176	143879.00m ²	100.00%
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NOTES:

- SEPARATE G.P'S TO BE DONE FOR EACH OF THE 6 PHASES.

- Phasing Boundary
- Edge of NO-GO Buffer

client

KRANS DEVELOPMENT (PTY) LTD

service provider



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PORTION 7 & PORTION 8

Subject Site

: 40.1883 Ha

Zoning	Land Use	Portion No.	No. of Units	Area in m ²	% Allo
General Residential Zone I - (G.R.Z.I)	Group/Town Housing	1 - 807	807	194005.00m ²	48.11%
Business Zone III - (B.Z.III)	Service Station (with Consent Uses)	808	1	4328.00m ²	1.07%
Community Zone I - (C.Z.I)	Place of Instruction	809 - 811	3	35828.00m ²	8.89%
Community Zone II - (C.Z.II)	Place of Worship	812 & 813	2	4386.00m ²	1.09%
Open Space Zone I - (O.S.Z.I)	Public Open Space	814	1	17147.00m ²	4.25%
Open Space Zone II - (O.S.Z.II)	Private Open Space	815 - 824	10	66822.00m ²	16.57%
Utility Zone - (U.Z)	Utility Service	825	1	452.00m ²	0.11%
Transport Zone II - (T.Z.II)	Public Road	826 - 829	4	19401.00m ²	4.81%
Transport Zone III - (T.Z.III)	Private Road	830 - 835	6	60851.00m ²	15.10%
TOTALS			835	403220.00m²	100.00%

Other

Total Area in Ha: 40.1883 Ha
Total Single Residential Zone I Area in Ha: 19.4005 Ha
Average Erf Size Single Residential Zone I: 240.40m²
Gross Residential Density Single Residential Zone I: 20.08 Units/ha
Nett Residential Density Single Residential Zone I: 41.60 Units/ha