

**CIVIL ENGINEERS REPORT
PORTION 104 OF THE FARM GANSE VALLEI NO 444,
DIVISION KNYSNA
BITOU MUNICIPALITY**

Date: 23 November 2022
Revision : 2
Report by: D. F. Scholtz Pr.Eng.



INDEX

1.	Terms of Reference	3
2.	Information Provided	3
3	Technical design parameters and standards	4
4	Water supply and storage	4
5	Sewer	6
6.	Roads and storm water	7
7.	Waste/Refuse	8
8.	Electricity supply	10

LIST OF APPENDICES

APPENDIX	Detail	No.
A	Locality map	A1
B	Site Development Plan	B1
C	Confirmation of the availability of bulk services	C1
D	Confirmation of bulk refuse services availability	D1
E	SMARTSAN Recycle Digester Sanitation System, Agreement certificate 2014/466	E1

1. TERMS OF REFERENCE

Tuinqa (Pty)Ltd was appointed by ACME Capital (PTY)Ltd to provide a services report in support of the proposed development of the site to allow for a tourist facility encompassing a 100 seater restaurant. The development proposal entails the development of a tourist facility that includes a restaurant (approximately 100 people) with wine tasting & wine sales.

The proposed tourist facility is approximately 900m² in extent.

A future main residential dwelling is also envisaged for the specific portion and one dwelling on the abutting property

The property is 15,6269 ha in extent.

The property owner owns three abutting properties namely 104/444, RE/43/444 and 191/444.

The report will make recommendations regarding the following:

- a) Water, Sewerage and stormwater services to Portion 104/444, RE/43/444 and 191/444, Ganse Vallei, Plettenberg Bay in the Bitou Municipal Area.
- b) Calculations and payment of augmentation and related fees in accordance with the policy of the Municipality.

2. INFORMATION PROVIDED

The following development information was obtained:

- | | |
|------------------------------|------------------------|
| - Site development plan | - Mira Architects |
| - Geohydrological Report | - Groundwater Complete |
| - Specialist Planning Report | - Marike Vreken |

Site Information:

The property is situated north of the N2 on the Rietvlei Road and is approximately 7 km from the Plettenberg Bay CBD.

Access to the site is from the N2 via the Rietvlei Road on an existing access. The access was previously used by neighboring farms as well.

The proposed tourist facility is planned for a relatively level area on top of one of the hills with gentle slopes away in all directions.

Existing services:

The site has two stormwater catchment dams. The one to the south will be used as retention runoff from the existing gravel road. will be incorporated in the proposed stormwater management of the site.

There are various existing gravel roads on the property.

Bitou Municipality have confirmed that Bulk water services and Bulk sewerage services are available for this development. (See letter of confirmation – Appendix C1)

3. TECHNICAL DESIGN PARAMETERS AND STANDARDS.

This report and services designs will be based on the following:

- 3.1 Guidelines for the provision of engineering services for residential townships-Dept of Community Development-1983 (aka “the Blue Book”).
- 3.2 Guidelines for human settlement- planning and design- Red Book.
- 3.3 Council’s policy on new developments- storage and transportation.
- 3.4 Augmentation and transport levies according to Council minute no 495-revised – July 2022.

4. WATER SUPPLY AND STORAGE

Water demand:

In Terms of Table J.4 (Guidelines) : Typical AADD (Annual Average Daily Demand) -unit demands for special land use categories -The total annual average daily demand (AADD) for the proposed 100 seat restaurant is 1000l/d (1 kL/d.)-Yearly demand is therefore **365 m³** per year.

The estimated water demand for the two dwellings is 2,6 kL/d i.e

4.2 Existing water services

The neighbouring property Portion 7 of 444- same owner -is currently connected to the municipal water network and is metered and billed.

(Account detail: Account number: 1965200010)

This connection can be used in times of emergency or extreme drought.

4.3 Water supply.

4.3.1 Potable water restaurant clientele

For the restaurant it is proposed that all drinking water will be commercial bottled water

4.3.2 Rainwater harvesting:

Mean Annual Rainfall (MAR) for Keurbooms area is typically 750mm per year.

The total roof area of the restaurant is 900 m², with an efficiency factor of 0,8 the total collectable water is **540 m³** per year.

Roof runoff to be installed with grids and leaf catchers and must implement a first flush system to reduce dust and contaminants from entering the water tanks.

The rainwater for domestic use needs to be treated with sand and carbon filters with reverse osmosis.

UV disinfecting is to be implemented as a final measure.

Water quality tests to be supplied to Bitou Municipality on a regular basis.

4.3.3 Borehole

Groundwater Complete conducted a geohydrological study as specialist input to the Water Use License Application (WULA) for the Farm Ganse Vallei 444 portion RE/7: The report indicated the following:

“-The estimated sustainable yield of 2,3 l/s is a safe and conservative rate for the borehole to be used.

“- The estimated sustainable yield is more than sufficient to provide the volume of 1.7 l/s applied for in the WUL application

“-Groundwater from the Telluric borehole only exceeded the South African National Standards for drinking water purposes (SANS 241:2015) for manganese

“- Groundwater from the Telluric borehole is considered to be of very good overall quality.”

The yearly yield in terms of the WULA is **53 000 m³** per year.

4.3.4 Storage requirements

It is proposed that at least three 10 000 liter tanks be installed to collect the rainwater from the roof of the restaurant tourist facility and be connected to a pressure system providing 2 to 4 bar for non-potable use.

4.4 Recommended use of water sources.

It is proposed that the municipal connection be used as potable water in emergencies, bottled water be used for restaurant patrons and that rainwater (and borehole water) be used in toilets.

Filtered and treated rainwater to be used for washing and other non potable uses.

It is further proposed that a greywater system discharging into a closed system retention pond be installed for use for irrigation.

Fire protection

Fire protection needs to be done in accordance with SANS 10400 - and be signed off by the Bitou Chief Fire Protection Services.

4.5 Fire risk category:

The site is classified as low risk GROUP 1: fire flow= 15 l/sec with 1 fire hydrant open.

Reserve Storage for fire flow required is 54 000 liters connected to an online variable speed drive pressure pump and automatic starting standby generator. To be signed of by specialist Fire Engineer.

4.6 Internal reticulation.

All water services can be located at the restaurant negating the need for pipelines. Where pipelines are installed, environmental considerations must be strictly adhered to.

4.7 Water supply – Environmental considerations.

4.7.1 Internal network.

The internal water reticulation is to follow the proposed road network where possible to reduce the impact to the environment. Consideration will be given to place pipeline routes to flattest grades and in previously disturbed areas.

Other services can be installed to share trenches and services can be installed under roads and pathways.

4.7.2 Trenching and pipeline placement.

Trenching to be done in accordance with SANS 1200. In addition to this all topsoil along the route to be removed to 150 mm deep, maintained and replaced as the final compacted layer. Regular compaction tests to be done to ensure adequate soil compaction in pipeline trenches.

In trenches of slopes over 25% grade - bio textiles and reseeded to be used to rehabilitate and protect the compacted topsoil.

Pipelines to be placed in consultation with and to recommendations of the environmentalist and in accordance with the approved Environmental Management Plan.

4.8 Proposed Main dwelling water supply.

Water supply to the two main farm dwellings will be from roof rainwater collection and from the borehole. It is proposed that at least 30 000 liters of rainwater storage is provided at each dwelling.

5. SEWERAGE

It is estimated that the combined grey and blackwater sewage flow will be 700 liter per day for the restaurant.

The proposed sewage system for the restaurant is a dedicated piped greywater system from bathrooms and kitchen to be diverted to a AQUALOOP Greywater Treatment System compact treatment plant fully compliant with BS:8525-2:2011 (British Standard for grey water treatment) & NSF 350:2014 (C) (American Standard for Commercial grey water treatment)

Greywater is to be dealt with strictly in compliance to the Guidelines for Greywater use in South Africa- WRC Report no TT 746/17.

All black water (organic products) from the bathrooms, laundry and kitchen areas be diverted to a SMARTSAN Recycle Digester Sanitation System N3 with Agreement Certificate 2014/466.

The two farm houses will be dealt with similarly with a N2 system installed at each house.

Internal sewage reticulation.

Sewage reticulation will be designed according to “Red Book” standards and installed in accordance with SANS 1200.

The internal network to consist of 110 and 160mm diameter Class 34 uPVC pipes with manholes at not more than 80 meters and at flow direction changes. Rodding eyes to be installed at all the top of lines. Grease traps to be installed.

Sewer lines are to be placed at a minimum of 1m below final road surface level and 650mm deep in erven and open spaces (minimum).

6. ROADS and STORMWATER

6.1 Access.

The site gains access via the N2 and Rietvlei Road (DR01788).

Access to Portion 104 from the is currently from via registered servitudes.

It is proposed to re-route the access and create a consolidated access over existing gravel roads with new servitude right of ways to be registered in favour of farm portions 104/444 and RE/43/444, over 191/444.

6.2 Road types and design guidelines.

Layer works, surfacing and geometry of the access road and parking to be in accordance with the “Red Book”.

The existing gravel farm roads are to be upgraded to allow public access.

The roads to remain gravel with sections where the grade exceeds 15 % to be paved with grass blocks.

The upgrading of the gravel roads and stormwater is to be done in line with the US Department of Transportation GRAVEL ROADS - CONSTRUCTION and MAINTENANCE GUIDE August 2015 and will include the following measures:

- Widening gravel roads to 3.5m min
- Resurfacing with a quarried gravel
- Use of the appropriate road shape for slope and drainage.
- Use stormwater dissipation measures at regular intervals to reduce the collection of runoff.
- Crossfall of 4-6%.
- A well compacted surface, using water whenever possible.
- Adequate gravel thickness.
- Minimal rills and corrugations.
- Good quality road material, with a well-graded mix of stone sizes

6.2 Stormwater management:

The restaurant and parking development is a small sub catchment of the Ganse Vallei area. The development is at the top contour and excessive runoff is not envisaged.

The effects of Stormwater runoff from the proposed restaurant and parking is deemed insignificant if dealt with as described below.

Roof rainwater harvesting is planned with minimal to no runoff. There are also large open areas where runoff can be dissipated

It is proposed to have parking areas constructed with grass blocks, encouraging water to drain through the voids where vegetation grows while offering sufficient structural integrity to allow for vehicular traffic. The Gras block paver can also be used for erosion control and is an efficient way of recharging the water table .At collection low points it is proposed to construct shallow soak-aways to enable natural seepage and evaporation.

7. WASTE/ REFUSE

7.1 Waste removal:

It is proposed that the municipality extend their bulk service to the access point at the Rietvlei road, and that an approved collection and storage area be constructed at the entrance to the development

Waste will be transported to the Municipal waste transfer and compaction facility at Kwanokuthula, at this facility waste is separated, compacted and transported to approved landfill sites.

7.2 Construction waste

7.2.1 Management and design in construction waste:

Local practices in the management and disposal of construction and demolition wastes depend on the availability of disposal and recycling sites

The first step is to evaluate what type of waste will be generated.

The process can only work if the waste is efficiently separated and stored for collection.

Effective waste management is the responsibility of all parties involved with the project's development. Each of the principal project participants—the Owner, their Architectural and Engineering (A/E) services (or Construction Management consultant), the Contractor, and Subcontractors—will engage in waste management to some degree throughout the project. Initially, the Owner and their Project manager must establish waste reduction goals and define what levels of diversion are achievable and reasonable under the project's conditions

The Contractor is responsible for the means, methods, techniques, sequences, and procedures of construction, which include waste disposal methods. However, the A/E's design team can contribute to waste reduction in several ways. These include:

- Observe Value Engineering principals.
- Be efficient in area and volume.
- Observe standard material and product dimensions
- Where possible, select construction systems that do not require temporary support, shoring, construction aids, or other materials that will be disposed of as debris during the project.
- Where possible, select materials that do not rely on adhesives, which require containers and create residue and packaging waste. Furthermore, adhesives inhibit salvage and recycling at the end of the component's or building's life.

- Where possible, reduce requirements for applied finishes, laminates, coatings, adhesives, and the associated scrap, packaging, and waste
- Where possible, avoid materials which are sensitive to damage, contamination, environmental exposure, or spoilage on-site, which increase the potential for jobsite waste.

The Owner and their consultant must determine how their waste management requirements will be represented in the contract documents and incorporated into the project. Several provisions are relevant to the project's overall waste reduction performance.

There are essentially three ways to represent waste reduction requirements in the contract documents.

- o Describe the waste reduction goals
- o Specify definitive minimum waste and debris diversion criteria
- o Develop incentives to reward the Contractor.

Require the Contractor to submit a Waste Management Plan.

7.2.2 Construction site waste reduction:

There are a variety of ways a Contractor can divert construction waste or demolition debris at the jobsite. The following general practices are common:

1. Up to 10-12% of a project's construction waste stream can be cardboard alone
 - o Purchase materials in bulk where possible. Avoid individual packaging for volume purchases.
 - o Use returnable containers and packing materials.
 - o Reuse non-returnable containers on the jobsite to the maximum extent possible. Develop one-hundred-and-one-uses for plastic barrels, buckets, and tubs.
 - o Give away non-returnable containers. Contact local and community organizations (schools, youth groups, community service groups).
2. Use scrap in lieu of cutting full new materials
3. For materials that are heated, mixed, exposed to environmental conditions, or otherwise subject to spoilage, limit preparation of these materials to quantities which can be installed within their expiration times.
4. Recycle damaged components, products, and materials, or disassemble them into their constituent materials for recycling.

7.2.3 Estimated waste volumes:

During the construction and upgrading phase waste generated will be limited to organic waste and soil- mostly topsoil of between 0- 200 mm deep.

The road reserves will be widened will be cleared and grubbed and a topsoil organic spoil in the order of 100 m³ is expected. It is proposed that this material be spoiled on site for later use. This type of material can also be used to cover land fill as the organic material will assist in greening the landfill.

The topsoil removed from road cut is expected to be in the order of 120 m³ and can be The topsoil can also be stockpiled and used for soil replenishment in eroded areas and small scale compost manufacture.

Other types of waste during the civils phase will be limited and dealt with by recycling.

During restaurant construction phase construction waste will include all building construction materials and will be dealt with as described in 7.2.2. It is estimated that approximately 50 m³ of building waste will be generated during construction.

7.3 Restaurant waste -operational:

The average for restaurants is in the order of 36 kg waste per day.
This would relate to approximately 1080 kg /month for the restaurant.

In order to mitigate this, a waste management plan should be drawn up where recycling is not only encouraged but enforced.

The farm needs to provide areas for recycling and to include organic waste and processing there off.

7.4 **Bitou Municipality have confirmed that Bulk waste services are available for this development. (See email of confirmation – Appendix D1)**

8. **ELECTRICITY**

The developer has proposed to go off grid for the electricity supply to the restaurant and a 25 k W system (minimum) with lithium battery storage is recommended.

The following energy reduction measures are proposed:

- 2 x 300-liter solar water geysers to be installed with insulated pipework and tanks
- passive ventilation is to be designed and implemented in the restaurant design
- solar variable speed drive pumps with bladder pressure systems used to pressurize the water network and filter systems
- insulate the roof with isotherm
- use passive sunlight effectively in the architectural design
- use led lighting

It is proposed that at least 200 m² be made available for solar panels and that oversize commercial type 500W panels be used. Roof area of restaurant is 1000 m²
The property has a 110 k VA standby backup generator that will cater for energy needs in emergencies.

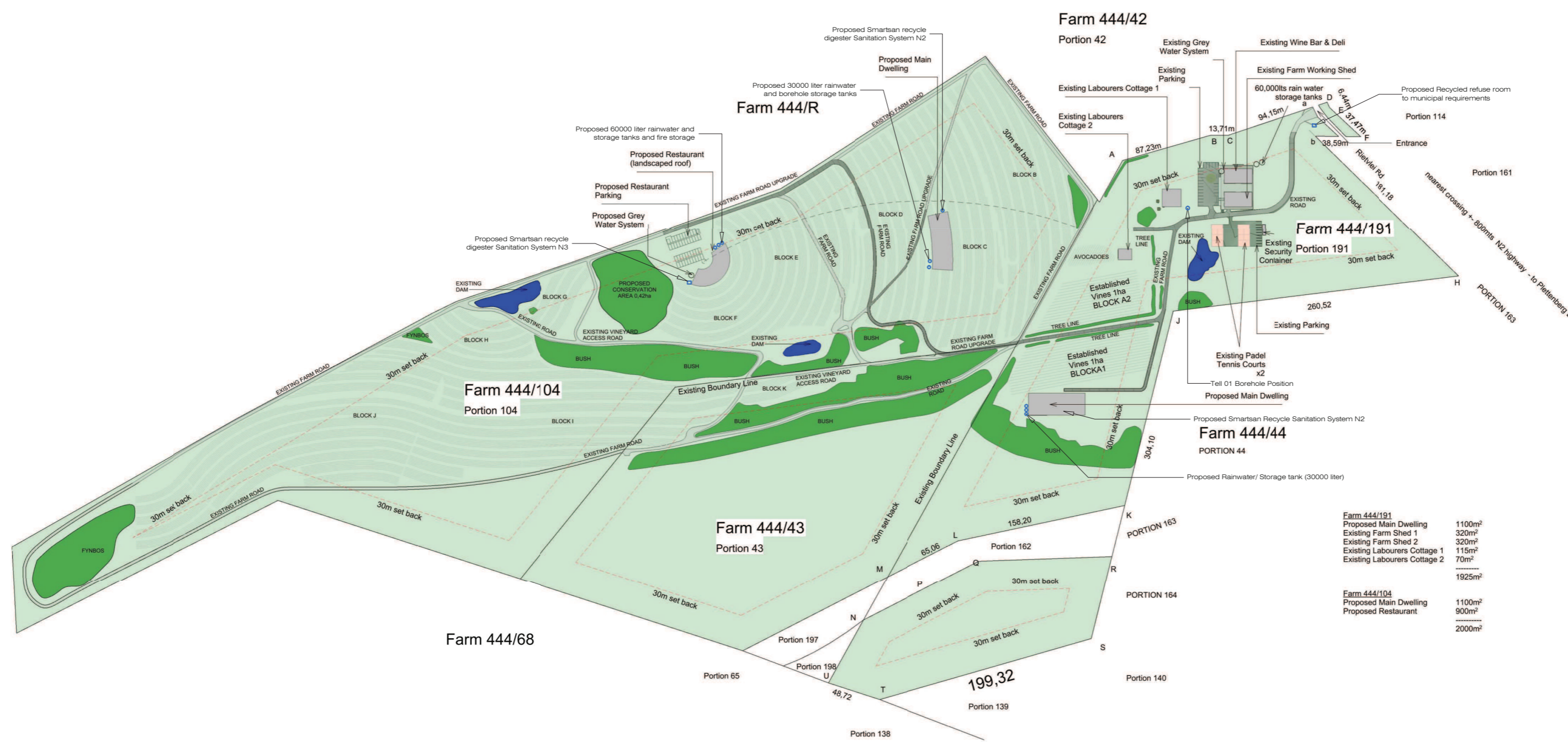
Francois Scholtz Pr.Eng,

APPENDIX A1



Annexure A1

APPENDIX B1



Farm 444/191	Proposed Main Dwelling	1100m ²
	Existing Farm Shed 1	320m ²
	Existing Farm Shed 2	320m ²
	Existing Labourers Cottage 1	115m ²
	Existing Labourers Cottage 2	70m ²
		1925m ²
Farm 444/104	Proposed Main Dwelling	1100m ²
	Proposed Restaurant	900m ²
		2000m ²

1 Site Plan 1
1 : 2000

Annexure B1

TELLURIC
PLETTERBERG BAY
MIRA ARCHITECTS



Project	Telluric Farm
For	ACME Capital PTY LTD Ptn 43/104&194 of 444 Plettenberg Bay
Description	Proposed Water & Sewer infrastructure
Scale	AS SHOWN
Prepared By	KD
Approved By	F. Scholtz Pr. Eng. Reg. no. 91014
Date	14 - 11 - 2022
Proj No.	B1
Rev	0

APPENDIX C1



munisipaliteit umasipala municipality

to be the best together

Private Bag X1002 Plettenberg Bay 6600
Tel+27 (0)44 501 3000 Fax +27(0)44 533 3485

Our Ref.

18/104/444/

Enquiries

M. Rhode

Tel

044- 501 3264

email address

mrhode@plett.gov.za

04 October 2022

To whom it may concern

Dear Madam/ Sir

CONFIRMATION OF BULK SERVICES: FARM 444 PORTION 104

We confirm that Bitou Municipality has sufficient bulk sanitation and water capacity for the above mentioned development.

Please contact the above official for any further information in this regard.

Yours faithfully

MR. V.W. FELTON
DIRECTOR: ENGINEERING SERVICES

11/10/2022
DATE

APPENDIX D1

From: Douglas Baartman <dbaartman@plett.gov.za>
Sent: Wednesday, 16 November 2022 07:25
To: Louise-Mari van Zyl <louise@cape-eaprac.co.za>; engineer@tuiniqua.co.za
Cc: Melony Anne Paulsen <mpaulsen@plett.gov.za>
Subject: RE: Proposed 100 seater restaurant on Portion 104 of 444 Ganse Vallei -Rietvlei road
Confirmation of capacity at Kwanokuthula waste transfer station

Good morning Louise

Re: Proposed 100 seater restaurant on Portion 104 of 444 Ganse Vallei -Rietvlei road.-- Confirmation of capacity at Kwanokuthula waste transfer station.

We hereby confirm that there is sufficient capacity at the Bitou Waste Transfer Station that situated in Kwanokuthula.

Regards

Douglas Baartman | Manager | Integrated Waste Management | Bitou Municipality
☎Tel: (044) 501 3461 | ✉Email: dbaartman@plett.gov.za | Website: www.bitou.gov.za
Physical Address: 4 Flying Cloud, Plettenberg Bay, Western Cape, South Africa



APPENDIX E1

DEPARTMENT OF PUBLIC WORKS
AGRÉMENT SOUTH AFRICA
(Approval of innovative construction products and systems)

Notice is hereby given that Agrément South Africa has, with effect from 21 October 2014, issued an Agrément certificate, details of which appear in the schedule hereto.

SCHEDULE
Agrément Certificate 2014/466

Name of product: SMARTSAN Recycle Digester Sanitation System

Certificate holder: Nano Water Technologies Africa (Pty) Ltd

Description: SMARTSAN Recycle Digester Sanitation System consists of the N-series and SMARTSAN Bulk units manufactured by Nano Water Technologies (Pty) Ltd, based in unit 57A, Ivory Street Thamsui Industries, George.

The N-series system is intended to serve two to three households (up to 15 people). The units are labelled N1, N2 and N3 depending on the number of households connected to the system. The N1 unit is for a single dwelling and has an elevated cistern filling tank that fills the toilet cistern through gravity after the toilet is flushed. The N2 & 3 units are fitted with a pressure pump to fill the toilet cisterns after the toilet is flushed.

The N-series system consists of three (3) reactor tanks and a fourth elevated cistern filling tank. The reactor tanks are configured one inside the other, with flow between the three tanks having to pass through a nano filter assembly before entering the next tank.

The Agrément certificate contains detailed information on the product and can be accessed at <http://www.agrement.co.za>

Copies are obtainable from: Chief Executive Officer (CEO)
Agrément South Africa
P O Box 395
PRETORIA, 0001

This gazette is also available free online at www.gpwnline.co.za