

New Residential Estate

Portion 38 of Farm 444, Ganzevalley, Plettenberg Bay, Western Cape



Civil Engineering Services Report

Revision: D (November 2023)

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Table of Contents

1. Executive Summary.....	3
2. Locality	4
3. Pre-Development Conditions.....	5
3.1 Site Topography	5
3.2 Site Vegetation.....	5
3.3 Site Geology	6
4. Description of the Proposed Development	7
5. Site Clearance.....	8
6. Roads and Parking Areas.....	8
6.1 External Roads	8
6.2 Internal Roads and Parking Areas	9
7. Stormwater Drainage.....	10
7.1 Existing Municipal Stormwater Network.....	10
7.2 Hydrological Data.....	11
7.3 Run-off Factors.....	11
7.4 Peak Flows.....	12
7.5 Internal Stormwater Network.....	12
7.6 Attenuation and Treatment.....	13
8. Sanitation	14
8.1 Existing Municipal Foul Sewer	14
8.2 Internal Sewage Network	15
9. Water Reticulation.....	16
9.1 Existing Bulk Municipal Network	16
9.2 Internal Water Reticulation	18
9.3 Irrigation Network.....	19
10. Solid Waste	20
11. Maintenance for Roads and Civil Services Infrastructure.....	21
12. Conclusion.....	22

List of Appendixes

- Appendix A: Site Development Plan
- Appendix B: Traffic Impact Assessment (*UDS*)
- Appendix C: Municipal Services Capacity Analysis (*GLS Consulting*)
- Appendix D: Civil Engineering Services Layout
- Appendix E: Minutes of Bitou Engineering Department Meeting – 9 March 2023

List of Figures

Figure 2-1: Locality – Portion 38 of Farm 444, Plettenberg Bay (Cape Farm Mapper).....	4
Figure 3-1: Topographical Contours – 5m intervals (Cape Fam Mapper version 2.7)	5
Figure 2-2: Environmental Sensitive Areas.....	6
Figure 3-3: Environmental Sensitive Vegetation towards Keurbooms River	6
Figure 4-1: Proposed Zoning Layout (<i>Marike Vreken Urban and Environmental Planners</i>)....	7
Figure 4-2: Proposed sub-division layout.....	7
Figure 6-1: N2/Rietvlei Road Intersection	8
Figure 6-2: Road Cross Section.....	9
Figure 7-1: Overland drainage patterns	10
Figure 8-1: External Sewer Masterplan & Link Upgrades – GLS Consulting (<i>Oct 2022</i>)	14
Figure 9-1: External Watermain Link Upgrades – GLS Consulting (<i>October 2022</i>)	16
Figure 9-2: External Bulk Supply Upgrades – GLS Consulting (<i>October 2022</i>)	17
Figure 9-3: External Bulk Supply Interim Solution – GLS Consulting (<i>October 2022</i>)	18
Figure 10-1: Refuse Vehicle Turning Circle at Entrance Facility	20

List of Tables

Table 1: SAWB 0014633W: Plettenberg Bay (Lat: 34° 3' Long: 23° 22').....	11
Table 2: Pre-development Run-off Coefficient.....	11
Table 3: Post-development Run-off Coefficients	11
Table 4: Peak Flow rates in m ³ /s.....	12
Table 5: Attenuation Requirement in m ³	13
Table 6: Attenuation and Treatment Potential of Internal Stormwater Swales in m ³	13

1. Executive Summary

VITA Consulting Engineers has been appointed by True Motives 99 Pty Ltd as the Civil Engineering Consultants for the proposed development on Portion 38 of Farm 444, Plettenberg Bay.

The proposed development is classified as a Greenfields Development, consisting of the following amenities:

- Single Residential - 12 Erven (1,400m² - 1,600m²)
- Entrance facility/guardhouse/maintenance and storeroom - 1 Unit (250m²)
- Gym, Conference & Office Rooms - 1 Unit (350m²)

The proposed rezoning is for a split-zoning, consisting of the following:

- Residential Zone II - 3.17ha
- Open Space Zone III - 5.41 ha

The objective of this report is to address all civil engineering issues generated by the proposed development and to provide sufficient information to the local and provincial authorities in terms of the required roads- and civil engineering infrastructure for the proposed residential development.

The following documents and guidelines have been used in the civil services infrastructure design and management implementation of this development:

- The Topographical Survey
- TIA completed by UDS Africa (*dated June 2022*)
- The Site Development plan compiled by Marike Vreken Urban Planners (*dated November 2022*)
- Municipal Services Capacity Analysis Report compiled by GLS Consulting (*27 February 2023*)
- Guidelines for Human Settlement Planning and Design (CSIR "Red Book")
- The South African National Roads Agency Limited: Drainage Manual

2. Locality

The development site is situated on Portion 38 of Farm 444, Plettenberg Bay. The site is approximately 8.58 hectares in extent and is situated on the north-eastern outskirts of Plettenberg Bay, approximately 4km from the CBD. The development is located within the Bitou Municipal district.

The site has an irregular polygonal shape and is bordered by the Goose Valley Golf Course (*southern- and western boundary*), the Keurbooms river estuary (*eastern boundary*) and Rietvlei Road/Minor Road 7214 (*northern boundary*). Access to the site is gained via the N2, off Rietvlei Road along the northern boundary of the site.



Figure 2-1: Locality - Portion 38 of Farm 444, Plettenberg Bay (*Cape Farm Mapper*)

There is a 9,45m wide right of way servitude in favour of Portion 38, across the Remainder of Portion 4 of Farm 444, due north of the development site.

3. Pre-Development Conditions

The pre-development site is mostly undeveloped, with an existing residential dwelling, stable structure and paddocks located near the centre of the site.

3.1 Site Topography

The topographical survey indicates that the property has a varying topography with fairly steep slopes. The highest portion is situated near the centre of the site (*next to the existing residential dwelling*), with an approximate level of 22 msl. The lowest portion of the site is situated on the north-eastern corner of the site, with an approximate level of 4.5 msl.

The residential portion of the development has fairly steep slopes, from the central peak towards the western- (*approximately 5%*) and northern-boundaries (*approximately 8%*).

The Open Space III portion has a steep slope in the direct vicinity of the central high point (*approximately 40%*) in the direction of the eastern boundary. The remainder of the Open Space III has a flat topography.

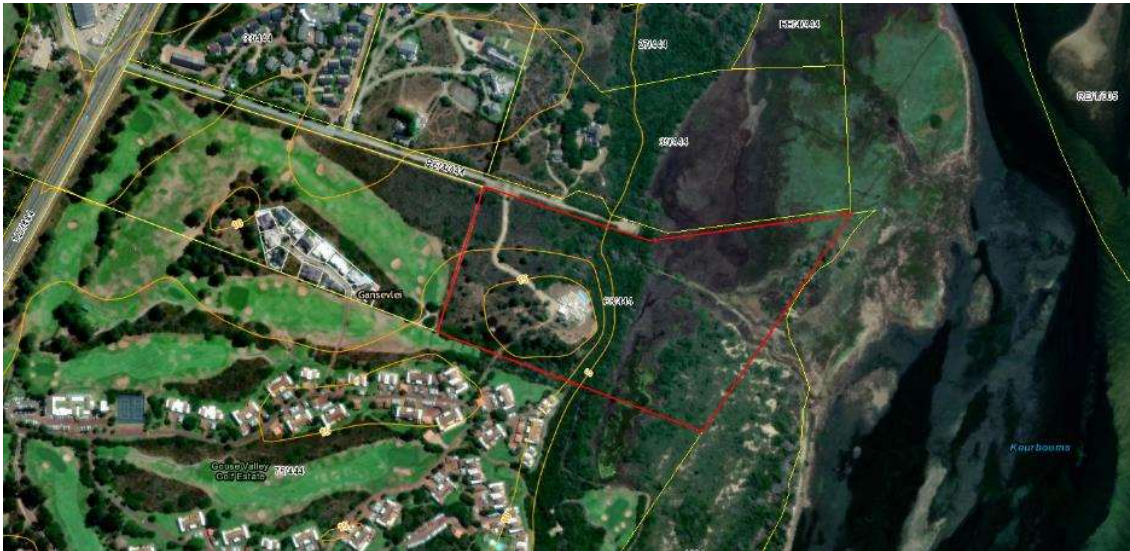


Figure 3-1: Topographical Contours - 5m intervals (*Cape Fam Mapper version 2.7*)

3.2 Site Vegetation

The site is covered by dense vegetation/thicket, including indigenous fynbos, alien trees and shrubs as well as large gum- and palm trees. A biodiversity investigation was compiled to determine the extent of the environmental sensitive areas on site. The biodiversity sensitivity map was used to determine the proposed unit layout to ensure that the housing units and roads/civil services infrastructure do not encroach into environmentally sensitive areas.

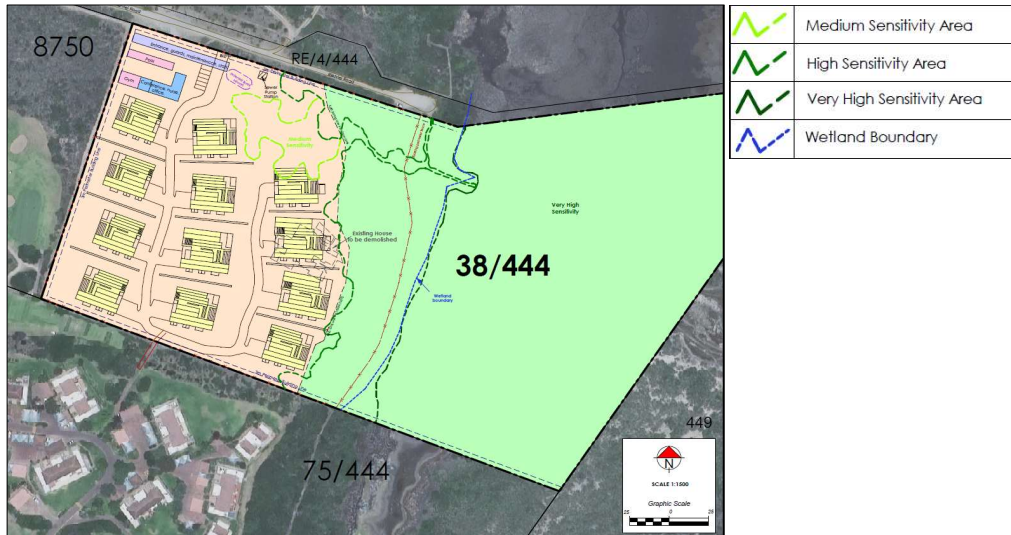


Figure 2-2: Environmental Sensitive Areas



Figure 3-3: Environmental Sensitive Vegetation towards Keurbooms River

3.3 Site Geology

The site is situated on the Kirkwood Formation (*Uitenhage Group*). The insitu materials on site is characterized by a relatively consistent soils profile. The site is underlain by Quaternary aeolian sands of several meters thick. These aeolion sands are overlain by medium dense, fine silty dune sand. A dense root-bed with organic rich topsoil of approximately 0mm-300mm thickness make up the top portion of the natural soil profile.

The soils on site are classified as "Soft Excavation" in terms of the SABS 1200 DM specifications. The dune sands are classified as non-plastic, with an estimated friction angle of approximately 30°, with no apparent cohesion.

The dune sands have an expected bearing capacity of approximately 100-125kPA, which will/must be confirmed by a suitable structural engineer for each individual units' foundations.

The dune sands have a very high permeability, which is estimated to be 10^{-3} mm/s or 86mm/day.

4. Description of the Proposed Development

The proposed development will consist of a sectional title Residential Zone II and an Open Space Zone III.

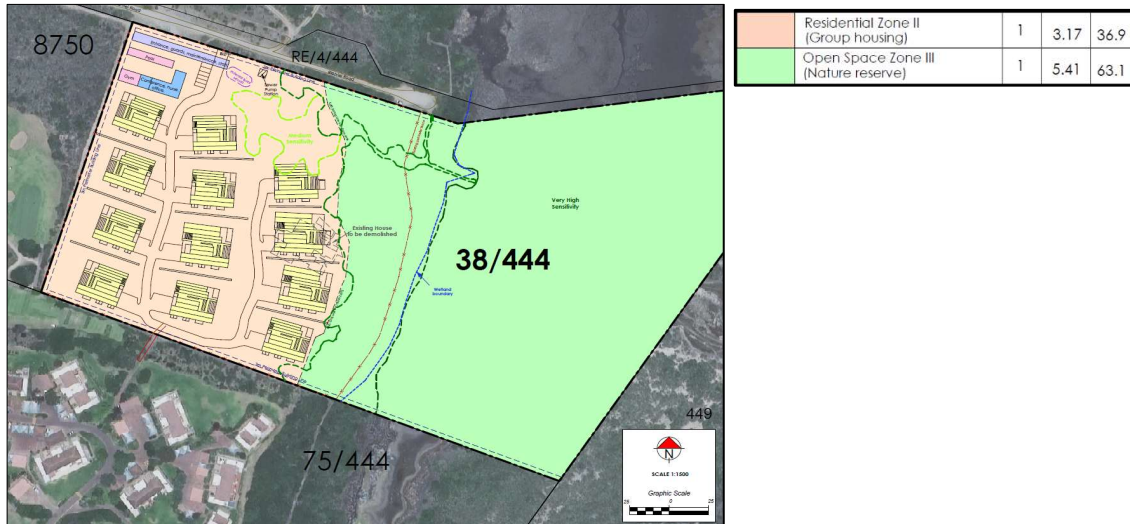


Figure 4-1: Proposed Zoning Layout (Marika Vreken Urban and Environmental Planners)

The “Open Space III” (5.41ha) portion of the development will serve as a “private nature reserve” which will be managed and owned by the development’s Body Corporate.

The “Residential Zone II - Group Housing” (3.17ha) portion of the development will consist of 12 residential dwellings.



Figure 4-2: Proposed sub-division layout.

5. Site Clearance

All road reserves and services corridors (*situated outside the environmentally sensitive areas*) will be cleared of vegetation and the top 0 - 300mm of organic rich topsoil will be stripped and stockpiled for re-use as part of the landscaping.

All existing structures which do not form part of the new development (*i.e. the stable, existing entrance gate, etc.*) will be demolished and rubble will be removed from site.

Due to the environmentally sensitive natural vegetation on site, care will/must be taken to not disturb any areas outside of the required civil works footprint.

6. Roads and Parking Areas

6.1 External Roads

UDS (Pty) Ltd was commissioned to compile a traffic impact statement for the proposed residential development and their findings were included in a report (*refer to Appendix B*).

Access to the proposed development will be off Rietvlei Road (*Minor Road 7214*) within a 9.45m wide right of way servitude (*Portion 4 of Farm 444*). Rietvlei Road (*Minor Road 7214*) fall within the Western Cape Government Road Network and shares an intersection with the N2, which fall within the South African National Roads Agency network. The Traffic Statement, along with the findings and recommendations were submitted to both the WCG and SANRAL for approval. SANRAL and the WCG accepted the finding of the Traffic Statement and endorsed the recommendations.



Figure 6-1: N2/Rietvlei Road Intersection

The UDS Traffic Statement concluded that:

- The eastern approach of Rietvlei Road be appropriately marked and signed.
- The gravel section along Rietvlei Road East be surfaced.
- The roads authorities consider upgrading the N2 / Rietvlei Road intersection to address the existing delays along the western approach of Rietvlei Road.

- Pedestrian desire lines be investigated when considering the upgrade of the N2 / Rietvlei Road intersection.
- Access arrangement and refuse collection to be confirmed during further design stages.
- The proposed development be supported from a traffic flow point of view.

6.2 Internal Roads and Parking Areas

The design philosophy for the proposed internal road network will be similar to that of a typical urban road network, which includes a minimum 2.0% crossfall and 0.5% longitudinal slope. This road network will consist out of 5.5m wide brick paved roads with formal kerbs/edgings, roadside channels and a stormwater drainage network.

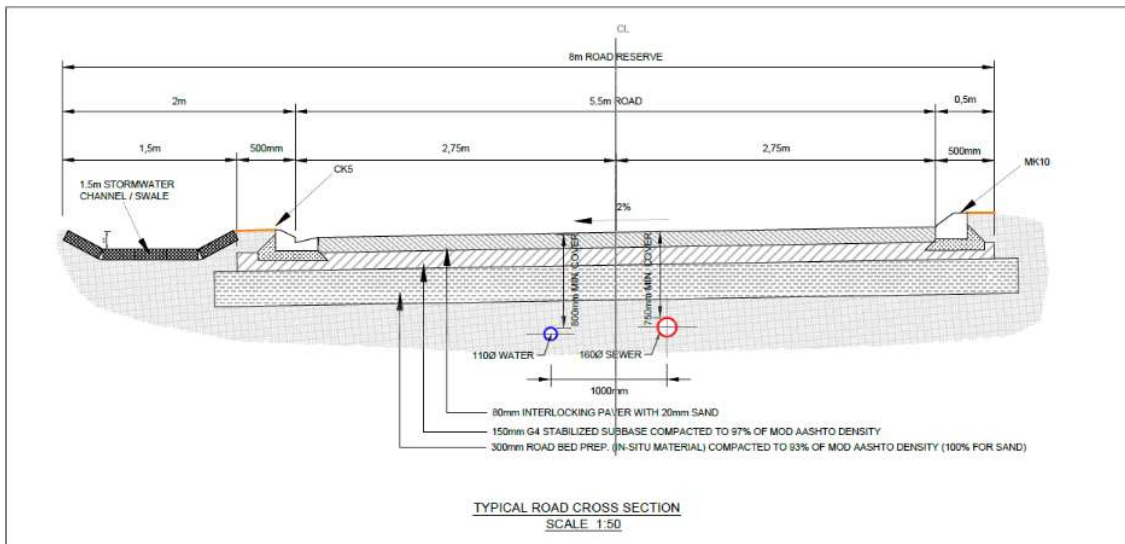


Figure 6-2: Road Cross Section

The internal roads/parking areas have been designed for low heavy vehicle traffic (*construction vehicles, furniture removal and refuse trucks*) and makes allowance for the insitu subgrade conditions.

- Road Category C/D (TRH4) or UC (UTG)
- Pavement Class ES 0.1 (TRH4).
- Structural design period 20 years
- Surface finish: Concrete Paving

Each residential unit will have a double garage and two additional parking bays in front of the garage. The internal roads will not be sub-divided and will therefore form part of the Body corporate maintenance responsibility.

7. Stormwater Drainage

7.1 Existing Municipal Stormwater Network

The pre-development site drains from the highest central portion towards the northern-, western- and southern-boundaries.

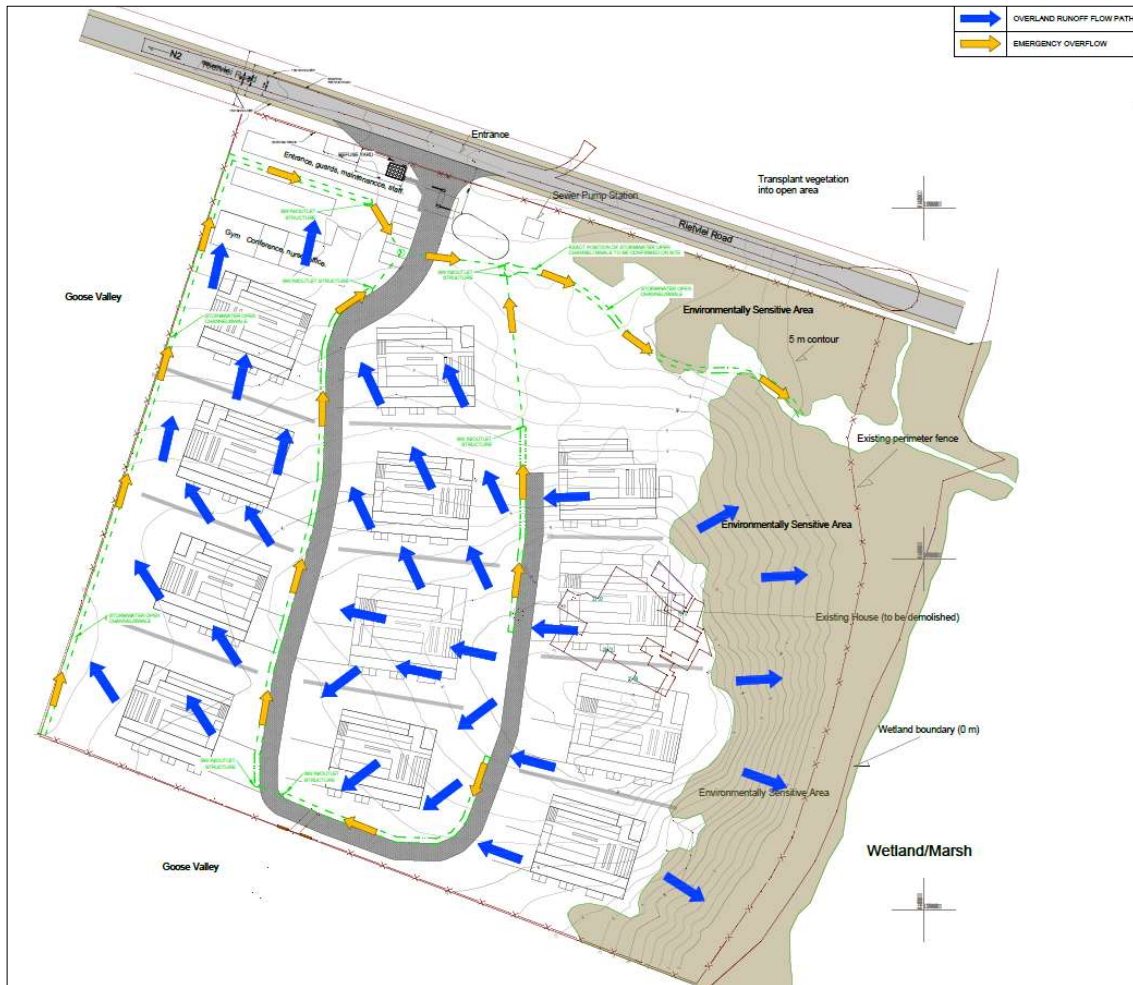


Figure 7-1: Overland drainage patterns

There is no formal bulk municipal stormwater infrastructure in the vicinity of the site or along the gravel portion of Rietvlei Road.

The high permeability of the insitu dune sands ensures that all stormwater run-off permeates into the subsoil layers and a formalised bulk stormwater connection for the development is not required.

The residential dwellings, roads- and civil infrastructure has been positioned to fall above the pre-scribed 5m contour.

7.2 Hydrological Data

The nearest SAWB weather station to the development site is Plettenberg Bay (POL).

Weather Service Station		Plettenberg Bay (POL)				
Weather Station Number		0014633W				
Mean Annual Precipitation		647mm				
Coordinates (<i>Longitude and Latitude</i>)		Long: 34°3' Lat: 23°22'				
Return Period	1:2yr	1:5yr	1:10yr	1:20yr	1:50yr	1:100yr
1 Day	56mm	83mm	104mm	128mm	163mm	194mm

Table 1: SAWB 0014633W: Plettenberg Bay (Lat: 34° 3' Long: 23° 22')

The hydrological rainfall data of rainfall station, Plettenberg Bay (POL), was used for all stormwater run-off calculations.

7.3 Run-off Factors

The pre-development topography, soil conditions and undergrowth were used to calculate the following pre-development run-off factors:

$$C_{pre} = (C_s + C_p + C_v) \times D_F \times F_t$$

Return Period	1:2yr	1:5yr	1:10yr	1:20yr	1:50yr	1:100yr
Run-off factor C	0.111	0.122	0.133	0.149	0.184	0.222

Table 2: Pre-development Run-off Coefficient

The development will not add substantial hard/impermeable surfaces to the catchment area (*less than 10%*) and will therefore have little impact on the run-off coefficients. The post-development run-off coefficients were calculated to be:

$$C_{post} = (C_{lawn} + C_{Residential} + C_{industry} + C_{business}) \times F_t$$

Return Period	1:2yr	1:5yr	1:10yr	1:20yr	1:50yr	1:100yr
Run-off factor C	0.134	0.147	0.161	0.179	0.222	0.268

Table 3: Post-development Run-off Coefficients

7.4 Peak Flows

The pre- and post-development peak flows were calculated to be:

$$Q = \frac{C \times I \times A}{3600}$$

Return Period	1:2yr	1:5yr	1:10yr	1:20yr	1:50yr	1:100yr
Pre-development (8.58ha)	0.128	0.237	0.338	0.466	0.723	1.004
Post-development (8.58ha)	0.154	0.286	0.408	0.562	0.872	1.211

Table 4: Peak Flow rates in m³/s

7.5 Internal Stormwater Network

The standard stormwater design principle, as set out in section 1 will be implemented in the planning and design of the internal stormwater system.

The following minimum design specifications will be implemented:

- Minimum pipe specification: Class 75 D Concrete spigot & socket pipes
- Minimum pipe diameter: 375mm Nominal diameter
- Minimum design flow: 1.0m/s inside a half-full pipe
- Maximum spacing between manholes/inlets: 80m

An open swale stormwater network will be designed to have sufficient capacity to adequately manage and convey up to a 1:5year rainfall event. The open swales network will follow the road network and will have inlet structures and pipe culverts at road crossings. For rainfall events with a return period larger than 1:5 year, the internal roadways will act as overland flow routes which will convey stormwater run-off towards the Keurbooms River.

The cohesion of the dune sands is very poor and will therefore be very susceptible to erosion. The following erosion preventative measures will be incorporated in the detail stormwater design:

- Concentration of stormwater will be minimised to prevent high volume/flow rates
- Hard surface run-off (*driveways*) will be routed into swales via the internal roadways
- Sheetflow into open swales will be promoted to maximise contact time with permeable dune sands
- All channels with an internal velocity higher than 1m/s will be formalised (*armorflex*)
- All unlined channels will be landscaped with appropriate vegetation
- Energy dissipation structures will be installed at high energy discharge points

Due to the likely occurrence of a seasonal perched ground water table, provision will be made for a subsoil drainage network beneath the roads. The subsoil drainage network will consist of a 110mm diameter perforated pipe network installed 800mm below the final road level.

7.6 Attenuation and Treatment

The secondary purpose of the open swale network will be to attenuate peak flows to pre-development rates and treat stormwater run-off.

The attenuation requirement, reducing the post-development peak flows to pre-development flow rates, were calculated using the ABT & GRIGG formula:

$$V_{st} = 60 \left(\frac{1+m}{2} \right) q_p a t_{ca} (1-a)^2$$

	1:2yr	1:5yr	1:10yr	1:20yr	1:50yr
Attenuation Required	4.05	7.51	10.72	14.78	22.93

Table 5: Attenuation Requirement in m³

The internal stormwater network makes allowance for the required attenuation volumes through the detention capacity and percolation rate of the stormwater swales. The gradient inside the swales will be less than the pre-development crossfalls, allowing stormwater run-off to accumulate inside the swales, providing more contact time with the permeable insitu dune sands. The percolation rate of the insitu dune sands is estimated at 10⁻³ mm/s or 86mm/day.

$$A_{fb} = \frac{WQ_v \times d_{fb}}{k \times (h_{fb} + d_{fb})t_{fb}}$$

	Wetted Perimeter	Catchment Area	1:50yr Attenuation Volume	Drainage Time
Swale: Western Boundary	175m ²	9,899m ²	2.65m ³	1.68hours
Swale: Central Roadside	225m ²	11,685m ²	3.12m ³	1.54hours
Swale: Eastern Roadside	805m ²	4,828m ²	1.29m ³	1.69hours
Swale: Northern Discharge	170m ²	7,295m ²	1.95m ³	1.27hours

Table 6: Attenuation and Treatment Potential of Internal Stormwater Swales in m³

8. Sanitation

8.1 Existing Municipal Foul Sewer

GLS Consulting was commissioned to undertake a re-analysis of the bulk municipal sewer infrastructure capacity and the impact of the proposed development in the existing network. GLS formalised their findings in a report (3 October 2022) which was presented to Bitou Municipality for approval.

The GLS report concluded the following:

- The master plan indicated that the proposed development should be accommodated within the existing Goose Valley Main pumping station (PS) drainage area.
- The existing Goose Valley Main PS (capacity of 21 L/s) with an accompanying 200 mm Ø rising main have sufficient capacity to accommodate the proposed development.
- Link services items 4 (new pumpstation), 5 (75mm diameter rising main), 6 & 7 (160mm underground gravity pipe and manhole network) will however be required to connect the internal sewer system of the proposed development to the existing Plettenberg Bay sewer system.

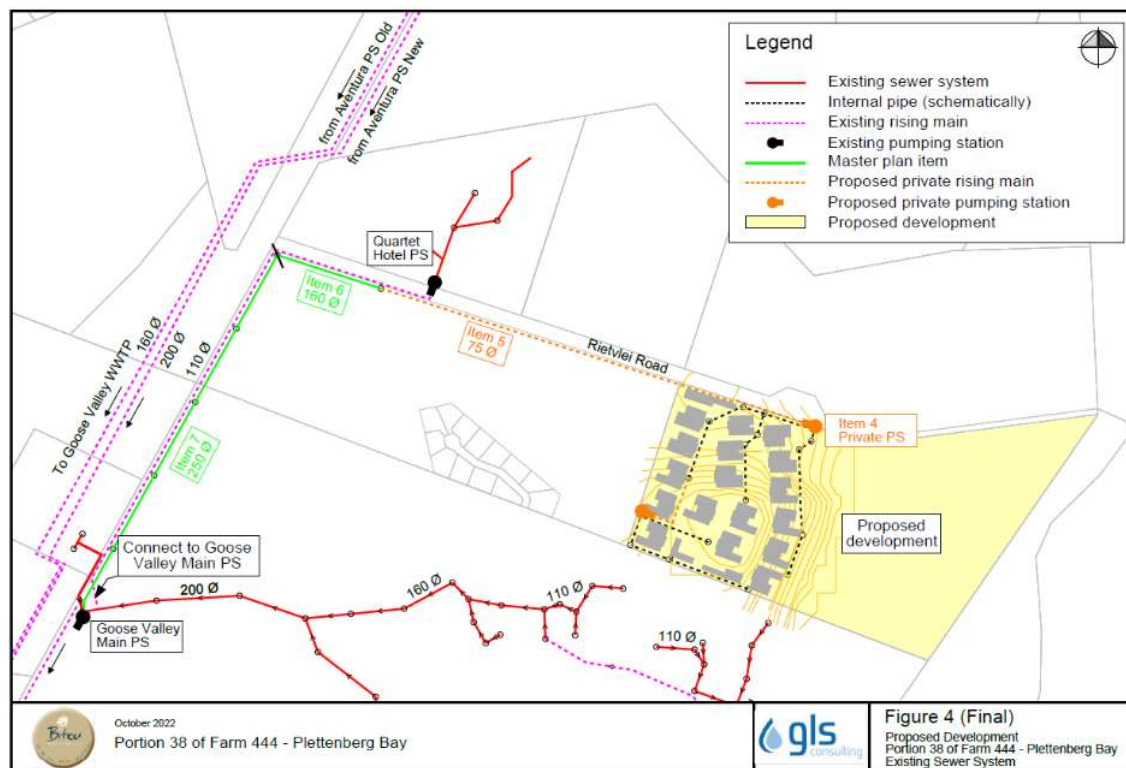


Figure 8-1: External Sewer Masterplan & Link Upgrades - GLS Consulting (Oct 2022)

8.2 Internal Sewage Network

The estimated sewage yield generated from the proposed development will be:

- Annual Average Daily Sewage Yield: 6.5m³ per day
- Peak Daily Wet Weather Sewage Yield (*Peak Factor* - 3.5): 0.5 l/s

The internal sewage infrastructure will consist of a 160mm diameter uPVC Class 34 gravity pipe network and round precast concrete ring manholes in the road reserves. The internal infrastructure will drain towards a new foul sewer pumpstation on the northern boundary of the site.

The pumpstation will convey all sewage from the development via a 75mm rising main towards a new 160mm underground pipe and manholes network inside the Rietvlei and N2 road reserves (*as per GLS Report - link items 4, 5, 6 & 7*)

The underground gravity network will adhere to the following requirements:

- Minimum self-cleansing velocity inside a half full pipe - 0.7m/s
- Maximum full-bore velocity - 3.5m/s
- Maximum spacing between manholes - 90m
- The bedding and blanket material for the internal sewage pipe trenches will adhere to SABS 1200 regulations for Class C bedding and blanket.

The underground pumpstation will have the following minimum requirements:

- The pumpstation will be equipped with duty- and standby pumpsets
- The pumpstation will have back-up power (*genset or inverter/batteries*)
- The pumpstation sump will have an emergency back-up volume equal to the 4-hour peak flow

9. Water Reticulation

9.1 Existing Bulk Municipal Network

The master planning analysis undertaken by GLS Consulting concluded the following:

- The master plan indicated that the proposed development should be accommodated within the existing Goose Valley reservoir zone.
- The proposed connection to the existing water system is to the existing 75 mm Ø water pipe to the northwest of the proposed development in Rietvlei Road, as shown on Figure 1. Upgrading of the 75 mm Ø water pipeline in Rietvlei Road to a 110 mm diameter pipeline is proposed to comply with the fire flow criteria.
- The bulk water system to the Goose Valley, Wittedrift and Matjiesfontein reservoirs is at capacity and should be upgraded according to the master plan before additional developments within the reservoir supply areas can be accommodated.
- The minimum upgrades required to improve the existing bulk supply system (*in order to accommodate the proposed development in the existing system*), are:
 - Master plan item 2 (3,6 km x 400 mm Ø replace existing 300 mm Ø abandoned AC pipe)
 - Master plan item BPW.B39 (0,9 km x 400 mm Ø replace existing 150 mm Ø bulk pipe).
 - Portion of master plan item BPW.B67 (1,0 km x 355 mm Ø replace existing 150 mm Ø bulk pipe).

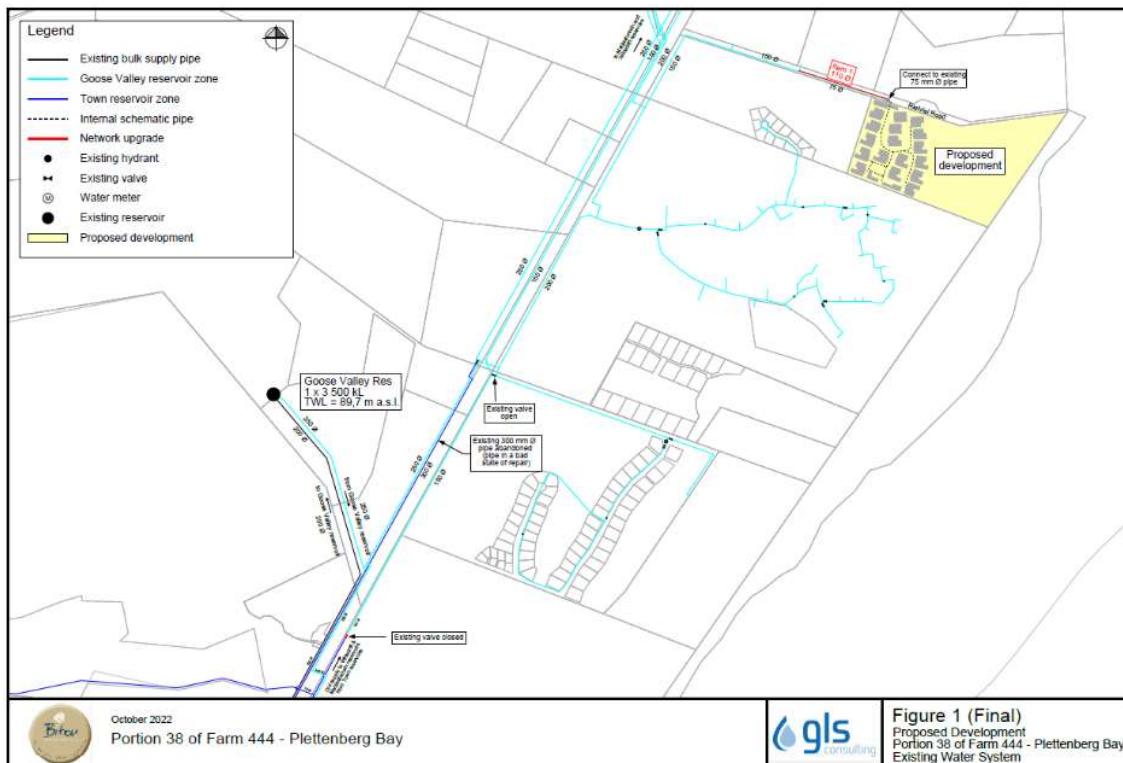


Figure 9-1: External Watermain Link Upgrades – GLS Consulting (October 2022)

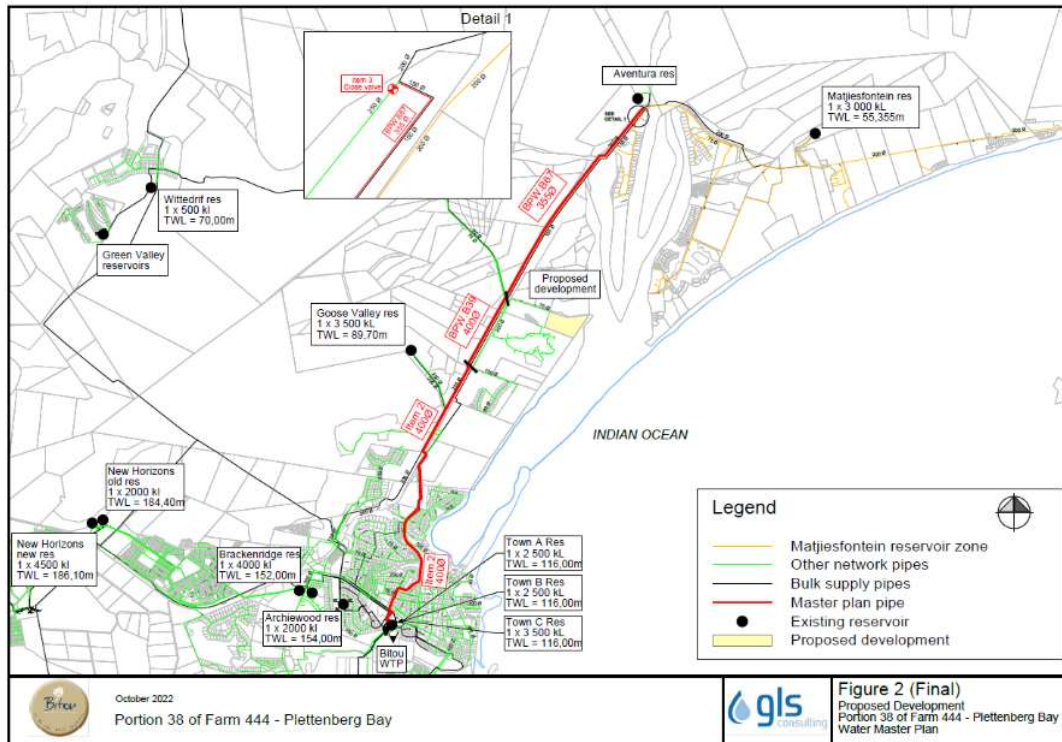


Figure 9-2: External Bulk Supply Upgrades - GLS Consulting (October 2022)

GLS estimated the costs for the design and installation of Item 2, BPW.B39 and BPW.B67 to be R36 million.

Various meetings with GLS and Bitou municipality was held to discuss a proposed interim solution to increase the bulk supply to the Goose Valley Reservoir. GLS provided the following temporary solution:

- Installation of an additional 160mm bulk main off the existing 160mm distribution main in the N2 road reserve (*refer figure 5*) which will free up an additional 860kl/day.
- There is sufficient capacity in the 860kl/day to accommodate the developments on Farm 444/38, Farm 304/32 and erf 6503.

This temporary solution was discussed with Bitou Municipality on 9 March 2023, who stated that they will except the temporary solution on the following conditions:

- Design, installation, etc. costs for the temporary solution will be the responsibility of the developer/developers and will not be deductible from the Augmentation Levee's
- The temporary solution is not a permanent solution and Augmentation Levee's for Water and Sewage will be used towards the permanent solution.
- The proposed pro-rata contribution towards the temporary solution must be resolved between the developers of the different properties.
- A Service Level Agreement must be drafted for the development.

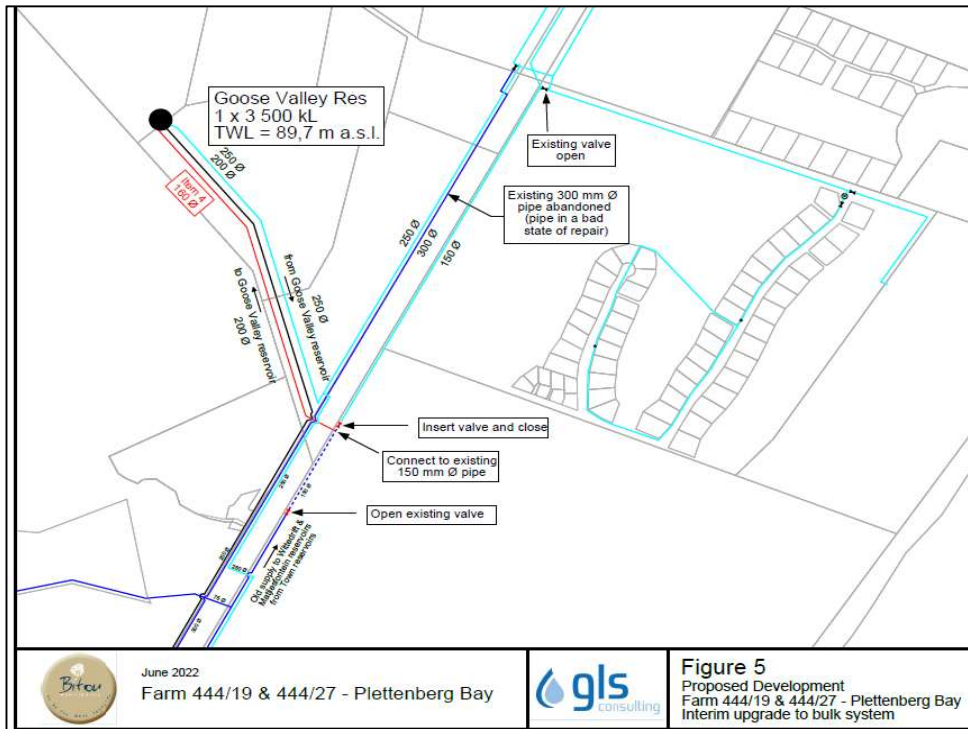


Figure 9-3: External Bulk Supply Interim Solution – GLS Consulting (October 2022)

The implementation of the temporary solution will be done by the developer of Portion 19 and 27 of Farm 444, as this development will be the first to have a civil contractor on site. The pro-rata contributions (*Farm 444/38, Farm 304/32 and Erf 6503*) for the installation of the pipe will be paid directly to the developer of Portion 19 and 27 of Farm 444.

9.2 Internal Water Reticulation

The potable water demand for the development will be:

- Gross Annual Average Daily Demand: 7.2m³ per day
- Instantaneous Peak Demand (*Peak Factor - 16*): 1.5 l/s
- Fire flow criteria (*low risk*): 15l/s @ 10m

The proposed internal metered water reticulation network will consist of a combined domestic and fire water reticulation network consisting of a 75mm diameter uPVC Class 12 potable water main. Allowance will be made for individual water meters to be located 1m inside the erf boundaries for every property.

The water reticulation network will adhere to the following design requirements:

- Minimum pipe size - 75mm diameter
- Minimum pipe class - uPVC Class 12 / HDPE PE100 Class 12.5
- Specials & Fittings - As per Bitou Municipal Engineering Standards
- The bedding and blanket material will comply with SABS 1200 regulations for Class C bedding and blanket
- Fire hydrants will be spaced for low-risk areas

9.3 Irrigation Network

Each homeowner will be responsible for the irrigation of their own property. Irrigation to individual gardens and road verge landscaping will be done from the potable water network. The irrigation schedule will fall outside of the normal operating peak hours and will therefore not have an adverse effect on the water supply.

Rainwater harvesting tanks, which collect stormwater run-off from roofs and hardened surfaces, will be prescribed as part of the estates building guidelines and will be confirmed by the homeowners association.

10. Solid Waste

The minimum requirements for domestic waste collection (*as per the National Domestic Collection Standards, 2011*) will be applicable to this development. The proposed development will generate approximately 20kg of solid waste per household per week.

The development's homeowner's association will administrate the collection of the domestic waste from each individual property towards a communal refuse storage facility located at the entrance to the proposed development. The refuse storage area will be adequately sized to accommodate the correct amount of 240l refuse bins for organic waste as well as make allowance for waste separation bins for temporary storage of recycling. Recycled waste to be collected by a registered Bitou Municipality service provider. A minimum target of 50% diversion of organic waste to be implemented by the homeowner's association.

Allowance will be made for adequate turning space at the entrance to the proposed development to accommodate the turning movement of a standard refuse truck.

The layout of the proposed refuse bay in the Minor Road 7214 road reserve was submitted and discussed with WCG. Final approval will be granted as part of the detailed civil engineering drawing submission.

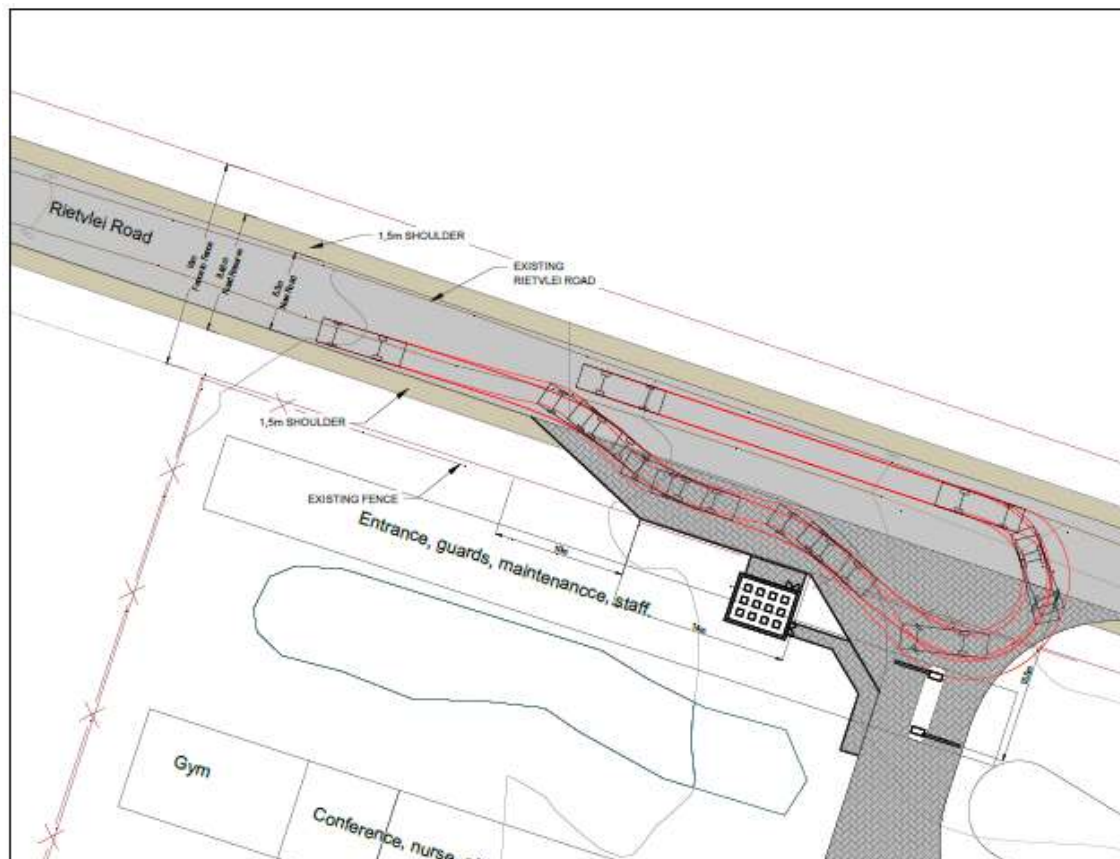


Figure 10-1: Refuse Vehicle Turning Circle at Entrance Facility

11. Maintenance for Roads and Civil Services Infrastructure

The completed development will be handed over to a Homeowner's Association/Body Corporate, who will except responsibility for the daily operations and maintenance of all civil infrastructure within the development.

The maintenance of the civil infrastructure will be explained to the HOA and they will be furnished with engineering maintenance manuals (*pumpstation*) and checklists (*weekly and monthly*).

It is advised that a professional engineer inspect and assess the civil services infrastructure on a yearly basis to ensure that the structural integrity and functionality of the civil amenities are intact.

Provision must be made for at least 2.5% of the total initial capital expenditure for the installation of the civil and roads infrastructure to be allocated for maintenance purposes.

All maintenance works must be carried out in accordance with all provisions of the Occupational Health and Safety Act (*Act 85 of 1993*). Maintenance staff must be well educated on the operation of the civil services network as a whole and potential safety hazards should be identified before any maintenance/remedial works are carried out. All maintenance personnel must always be equipped with the necessary protective gear (*PPE*).

12. Conclusion


The findings of this Civil Engineering Services Report provide sufficient evidence to **support** the application for

"The rezoning of Portion 38 of the Farm Ganse Valleï No 444 from 'Agriculture Zone I' to 'Residential Zone II' (group housing - ±3.17 ha) & 'Open Space Zone III' (nature reserve - ±5.41 ha) for a group housing development in terms of Section 15(2)(a) of the Bitou Municipality Land Use Planning Bylaw, 2015"

A Services Level Agreement, between the Developer and Bitou Municipality, must be compiled to address the upgrading of the external engineering infrastructure (*i.e. potable water and sewer networks*) required for this development.

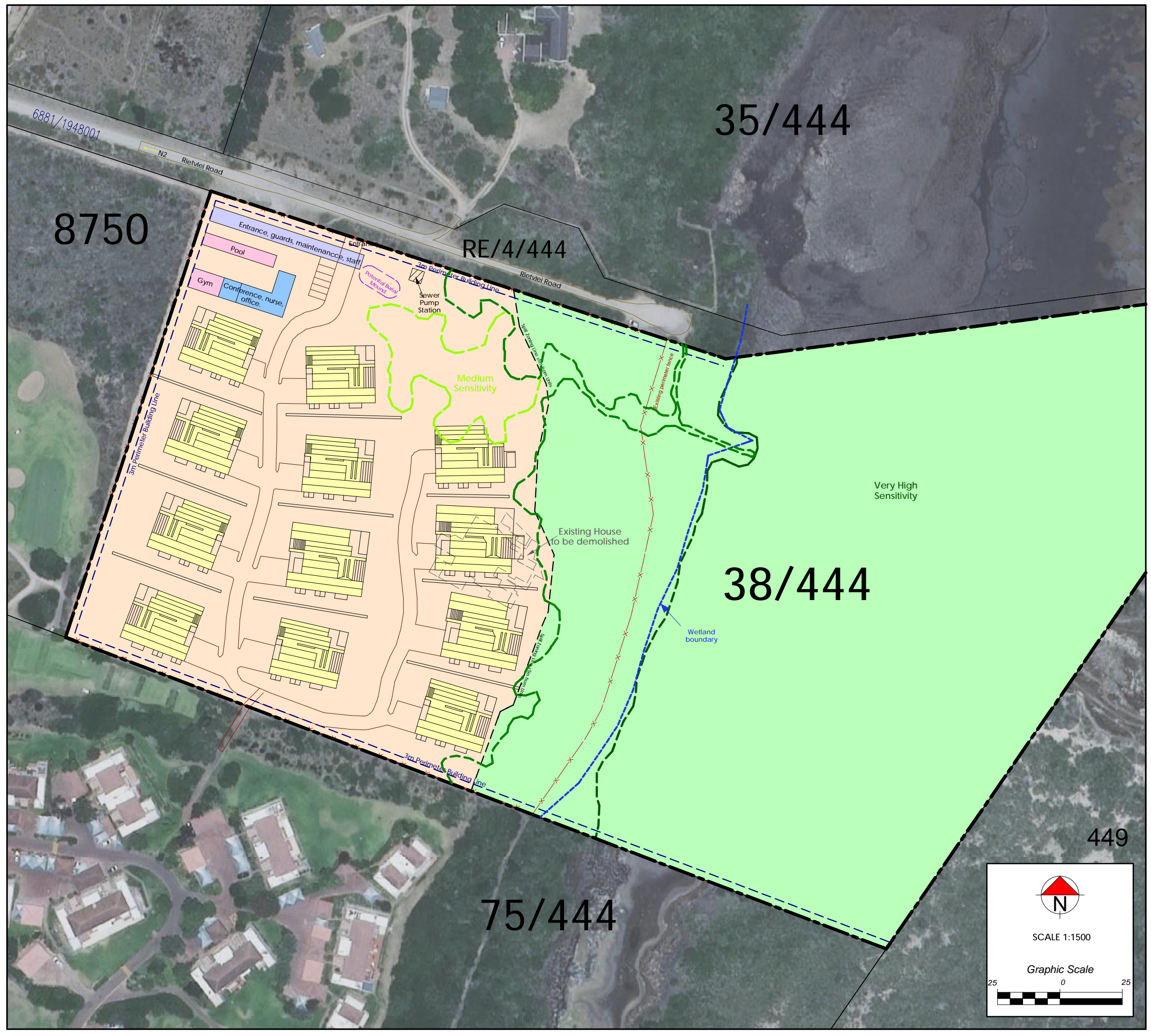
The Service Level Agreement must clearly stipulate the following:

- The phasing of the proposed development
- The extent of the external upgrades required for each phase.
- Augmentation Levee's payable for each phase of the development
- Responsibility for external upgrades
- Application of Augmentation Levee's for external upgrades in lieu of direct payment to Bitou Municipality.



Riaan van Dyk (*Pr Eng 20150503*)
for Vita Consulting Engineers

Appendix A: Site Development Plan



**PORTION 38 OF THE FARM
GANSE VALLEI NO 444**

SITE DEVELOPMENT PLAN

LEGEND:

ZONING	QTY	HA	%
Residential Zone II (Group housing)	1	3.17	36.9
Open Space Zone III (Nature reserve)	1	5.41	63.1
Medium Sensitivity Area			
High Sensitivity Area			
Very High Sensitivity Area			
Wetland Boundary			
TOTAL	2	8.58	100

- NOTES**
1. For erf data, refer SG6687/1948
 2. Sizes & dimensions are approximate and subject to final survey
 3. 1m contour intervals based on Contour Plan from SJM Surveys dated October 2008
 4. (12) x Sectional Title Group Housing Units (655m² each)
 5. 3m Perimeter Building Lines proposed
 6. (2) x Garage bays / unit
(6) x Visitor parking bays
 7. Density (max 20u/ha) = 1.399 u/ha
 8. Communal Open Space (min 80m²/unit) = > 7 ha
 9. Internal Road Width = 5m

DRAWN:	HL	CHECKED:	MV
PLAN NO:	Pr22/11/F444Ptn38/SDP07		
PLAN DATE:	6 Nov 2023		
STORED:	z:\drawings\App\Pr2211-F444Ptn38/SDP06.dwg		

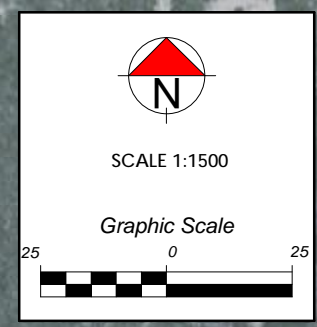
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MUNICIPAL STAMP

Marike Vreken
URBAN & ENVIRONMENTAL PLANNERS

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Appendix B: Traffic Impact Assessment (UDS)

Date: 16 November 2023

Our Ref: UDS567/Reports

Marike Vreken Town Planners CC
PO Box 2180,
Knysna,
6570

Attention: Hans Labuschagne

Dear Sir

REZONING OF PORTION 38 OF FARM 444, PLETTENBERG BAY: AMENDMENT TO THE TRAFFIC IMPACT STATEMENT

This reports serves an amendment to the original Traffic Impact Statement (TIS) dated 22 June 2022 in order to address comments received from the Western Cape Government on the 9 March 2023.

1. LOCALITY

The subject property is located in Plettenberg Bay, 460-metres east from the National Route 2 / Rietvlei Road intersection. See **Diagram 1** below and the attached **Locality Plan**.



Diagram 1: Location of Subject Property



head office
Unit 8, Time Square Building,
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Stellenbosch

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V&A Waterfront
8002

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P v Blerk PrEng
JN Louw PrCPM

offices
Clanwilliam, Stellenbosch,
Somerset West

Reg no. 2003/043709/23

urban development solutions



2. PROPOSED DEVELOPMENT

The original development proposed to have 17 large single residential units. This amendment will evaluate the updated layout which proposes 12 large single residential units inside an access-controlled complex which will have one access to the existing Rietvlei Road East (Minor Road 7214) which links to the N2/Rietvlei Road intersection.

Please see the proposed layout on the attached **Site Development Plan** prepared by *Marike Vreken Town Planners CC*.

3. TRAFFIC IMPACT

3.1 Existing Traffic

Traffic counts were performed at the intersection of the N2 and Rietvlei Road on Tuesday, 26th April 2022 from 06:00 – 09:00 and 15:30 – 18:30. See the attached **Figure 1**. The expected peak hours were found to be 07:30 – 08:30 and 16:15 – 17:15, which coincides with the expected morning and evening commuter peak periods.

The total two-way traffic along the N2 in 2022 is approximately 860 vehicles during the AM peak hour and 815 vehicles during the PM peak hour.

3.2 Traffic Generated

The South African Trip Data Manual TMH17 was used to estimate the trips expected to be generated by the proposed development. TMH17 suggests a trip generation rate of 1 trip per single residential unit. Therefore, the proposed development will generate 12 trips during the AM (3 IN / 9 OUT) and in the PM (8 IN / 4 OUT) peak hour.

3.3 Trip Distribution

The background traffic was used to model the trip distribution as shown in the **Attached Figure 3**.

3.4 Traffic Growth and Impact

The existing traffic was analysed using SIDRA Intersection Analysis 9.1. Service levels A to D are generally considered acceptable, where a level of service (LOS) below D and a degree of saturation above 0.85 is considered unacceptable. These standards will apply to Rietvlei Road East and West, however for the required standards along National Route 2, TMH16, Traffic Assessment Standards and Requirements, published by the South African National Roads Agency Limited (SANRAL) was consulted and recommends a LOS A or B for Class 1 or 2 roads in rural areas.

The Western Cape Government Road Network Information System (RNIS) was used to estimate a growth rate in the area. Historical traffic counts at the N2/Rietvlei Road intersection are available and based on these counts, the average growth rate per annum estimated along both sides of the N2 is 3.14% and 3.36% along the western section of Rietvlei Road. These growth rates were used to project the 2022 traffic volumes to 2028 to evaluate a future 5-year scenario, as shown in the **Attached Figure 2**.

N2 / Rietvlei Road Intersection

The N2 / Rietvlei Road intersection is a priority-controlled four-legged intersection with a marked stop-control on Rietvlei Road West. There are no road markings on Rietvlei Road East as shown in **Diagram 2**. It should be noted that Rietvlei Road on the western side of the intersection extends up to the R340 and also serves the BUCO retail centre on the north-western corner of the subject intersection.



Diagram 2: N2 / Rietvlei Road Intersection

Using the existing 2022 traffic counts and the current lane layout, the analyses shows that the AM peak hour experiences an overall average delay of 5.5 seconds with the worst delay experienced (47.4 seconds) on the right-turning movement from the western approach of Rietvlei Road (LOS E). During the PM peak hour, the intersection experiences an overall average delay of 5.2 seconds with the worst delay experienced (36.3 seconds) on the right-turning movement from the western approach of Rietvlei Road (LOS E). The roads authorities should consider upgrading the intersection or changing the intersection control to alleviate the existing LOS E along Rietvlei Road West. Both a roundabout or a signalized intersection will reduce delays. It should be noted that the National Route 2 is experiencing a LOS A in both directions during the AM and PM peak hour, which is in line with the required standards in TMH16.

Using the projected 2028 traffic counts and the current lane layout, the analyses shows that the AM peak hour is expected to experience an overall average delay of 28.3 seconds with the worst delay (321.6 seconds) experienced on the right-turning movement from the western approach of Rietvlei Road (LOS

F). During the PM peak hour, the intersection is expected to experience an overall average delay of 16.5 seconds with the worst delay (142.9 seconds) experienced on the right-turning movement from the western approach of Rietvlei Road (LOS F). As stated, the roads authorities should consider upgrading the intersection or changing the intersection control to alleviate the LOS F, however, it should be noted that the National Route 2 is expected to maintain a LOS A in both directions during the AM and PM peak hour.

Using the projected 2028 traffic counts, the current lane layout and the addition of the generated traffic for 12 units instead of the previously proposed 17 units, the analyses shows that the AM peak hour is expected to experience an overall average delay of 30.9 seconds with the worst delay (354.9 seconds) experienced on the right-turning movement from the western approach of Rietvlei Road (LOS F). During the PM peak hour, the intersection is expected to experience an overall average delay of 18.2 seconds with the worst delay (159.7 seconds) experienced on the right-turning movement from the western approach of Rietvlei Road (LOS F). As previously mentioned, the roads authorities should consider improving the intersection or changing the intersection control to alleviate the existing delay of the right-turning movement on Rietvlei Road West. Both a roundabout or a signalized intersection will be able to accommodate the expected traffic. It should be noted that the proposed development will only generate approximately five vehicles, in the AM peak hour, and three vehicles, in the PM peak hour, opting to turn right at the intersection from Rietvlei Road East which is expected to experience an average LOS E and D, respectively. The generated traffic, a maximum of 12 trips (1.05% of the total traffic at the intersection) in the AM and PM peak hour, is not expected to affect the flow of traffic along the National Route 2 to such an extent that it will result in a change of the LOS A.

4. GEOMETRY

The N2 (NR00208) is a National Route with a posted speed limit of 100km/h at the Rietvlei Road intersection. Rietvlei Road East is a minor road (MR07214) ending in a cul-de-sac and Rietvlei Road West is a divisional road (DR01788) which becomes a Minor Road (MR07233) before intersecting with the R340 which is a Main Road (MR00390).

The proposed development's security access is located approximately 520-metres east of the N2 / Rietvlei Road intersection. The intersection, as previously mentioned, is stop-controlled along Rietvlei Road west, however the eastern approach of Rietvlei Road is unmarked. The required road markings and signings should be applied.

Approximately 175-metres of gravel road exists along Rietvlei Road from the access to the existing adjacent development up to the boundary of the proposed development. It should be considered to surface this section of the road up to the access of the proposed development.

According to the Civil Engineering Services report as prepared by *Vita Engineers*, it is proposed that the development be gated with one entry and exit lane. The entry lane allows for 15-metres of stacking distance which is considered sufficient. It is recommended that entry and exit lanes are wide enough to accommodate emergency vehicles.

A refuse room is proposed west of the entrance and an embayment is shown in the Civil Engineering Services report previously mentioned. The wheel-tracking for the refuse vehicle is also shown to ensure sufficient space for the turning movement. See **Diagram 3**.

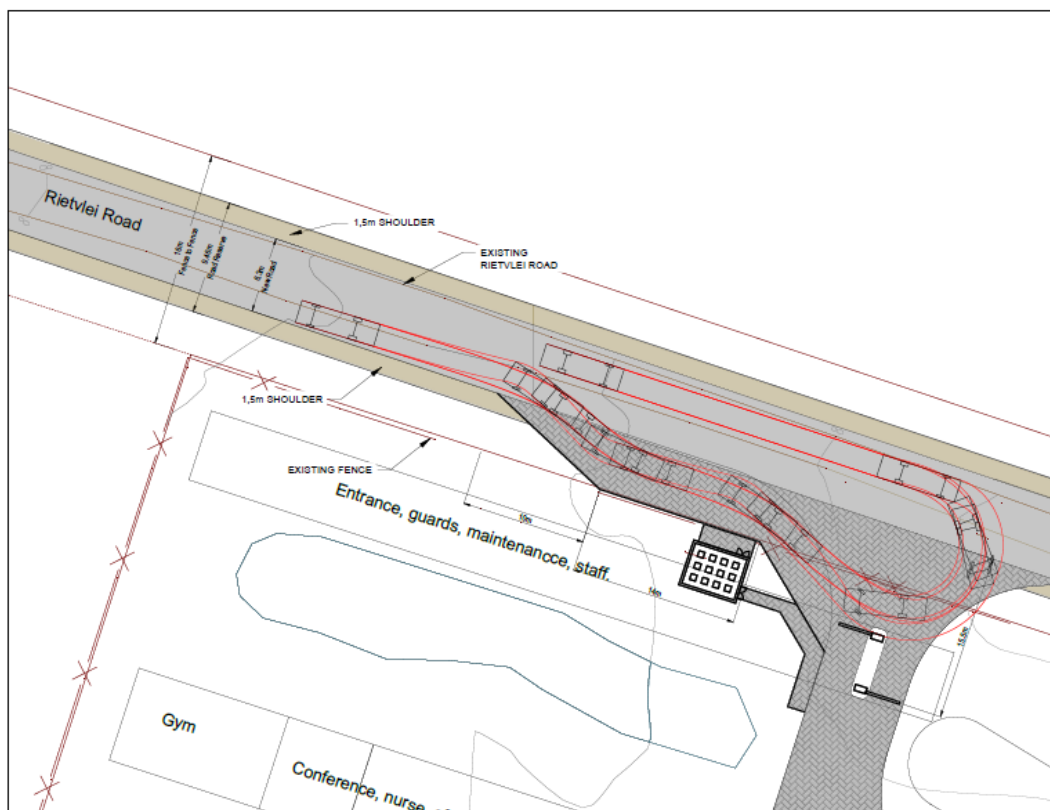


Diagram 3: Proposed entrance, refuse embayment and wheel-tracking (Source: Civil Engineering Services Report as prepared by VITA Engineering)

5. PARKING

According to the town planners, the proposed development is classified as ‘Residential II Group Housing’ which has the following parking requirements:

At least two parking bays per group house, both may be provided at such group house, or part of the required number of parking bays at some of the group houses and the remainder in the form of communal parking for the group housing scheme concerned, or the entire requirement in the form of communal parking.

The development proposes two bays per unit as well as an additional 6 visitors’ parking bays. This is considered sufficient.

6. NON-MOTORISED AND PUBLIC TRANSPORT

A non-motorised transport facility exists on the eastern side of the N2, separated from the road, however, there are no pedestrian crossings. It is recommended that along with the previously mentioned consideration for upgrades at the intersection, pedestrian desire lines are investigated.

Within the development, a pedestrian and non-motorized facility connects the development to the golf estate on the southern boundary.

Approximately 40-metres north of the centre of the N2 / Rietvlei Road intersection, public transport embayments exist on either side of the N2, see **Photo 1** below. The proposed additional 12 residential units are not expected to affect public transport significantly and therefore no additional public transport or non-motorized transport facilities are required due to the development.

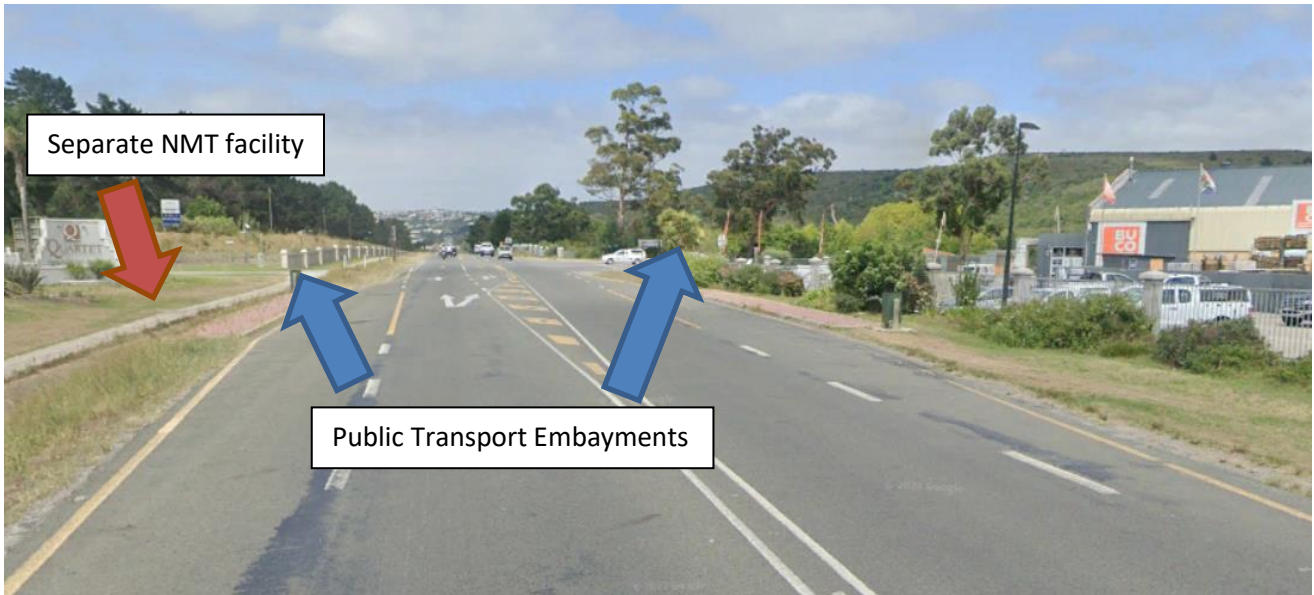


Photo 1: Public Transport Embayments on either side of the N2, looking toward the N2 / Rietvlei Road intersection with the development toward the left of the intersection.

7. CONCLUSIONS

It can therefore be concluded that:

- This reports serves an amendment to the original Traffic Impact Statement (TIS) dated 22 June 2022 in order to address comments received from the Western Cape Government on the 9 March 2023.
- The subject property is located in Plettenberg Bay, 460-metres east of the intersection between the National Route 2 and Rietvlei Road.
- The proposed development will accommodate 12 single residential units inside an access-controlled complex instead of the previously proposed 17 units.
- Traffic counts were performed at the N2 / Rietvlei Road intersection on Tuesday, the 26th April 2022.
- Based on TMH17, 12 trips will be generated by the development in the AM (3 IN / 9 OUT) peak hour and PM (8 IN / 4 OUT) peak hour.
- Using historical counts available on RNIS, a growth rate of 3.14 % per annum was established and applied to analyse the future scenario in 2028.
- The existing Levels of Service at the intersection of the N2 / Rietvlei Road are acceptable. LOS A are experienced along both sides of the N2 in the AM and PM peak hour. The worst delay, in both the AM and PM peak hour is the right-turning movement along the western approach of Rietvlei Road which experiences a LOS E.
- In 2028, the LOS A along the N2 is maintained, however, in the AM and PM peak hour, the LOS E along the western approach of Rietvlei Road decreases to a LOS F. After the development traffic is added, the delays increase along Rietvlei Road, however it should be considered that the development traffic accounts for approximately 1.05% of the overall traffic at the intersection.
- The roads authorities should consider upgrading the intersection or changing the intersection control to address the existing LOS E and future LOS F based on predicted traffic growth. Both a roundabout or signalized intersection will be able to accommodate the expected traffic.
- No additional lanes are required to accommodate the traffic generated by the development.
- Appropriate road signage and markings are required on the eastern approach of Rietvlei Road.
- It is recommended that the eastern approach of Rietvlei Road be surfaced up to the access gate.
- One entry and one exit lane is proposed. It is recommended that the lanes are wide enough to accommodate emergency vehicles.
- The proposed stacking distance is 15.0-metres and is considered sufficient.
- Refuse will be kerbside and an embayment is proposed to assist with the turning movement of the refuse vehicle.
- Each unit will include sufficient two on-site parking bays as well as an additional 6 visitors bays. This is considered acceptable.
- No additional infrastructure is required to accommodate public transport or non-motorised transport generated by the proposed development.


8. RECOMMENDATIONS

It is recommended that:


- The eastern approach of Rietvlei Road be appropriately marked and signed.
- The gravel section along Rietvlei Road East be surfaced.
- The roads authorities consider upgrading the N2 / Rietvlei Road intersection to address the existing delays along the western approach of Rietvlei Road.
- Pedestrian desire lines be investigated when considering the upgrade of the N2 / Rietvlei Road intersection.
- The proposed development be supported from a traffic flow point of view.

More information relating to the Traffic Impact Statement can be provided upon request.

Yours faithfully,



Compiled by: Shameez Patel Papathanasiou (MScEng)



Approved by Piet van Blerk (Pr Eng)

UDS AFRICA



ATTACHMENTS

Locality Plan

Layout Plan

Figure 1 - Existing AM/PM Peak Hour Traffic Volumes

Figure 2 - Estimated 2028 AM/PM Peak Hour Traffic Volumes (including traffic growth)

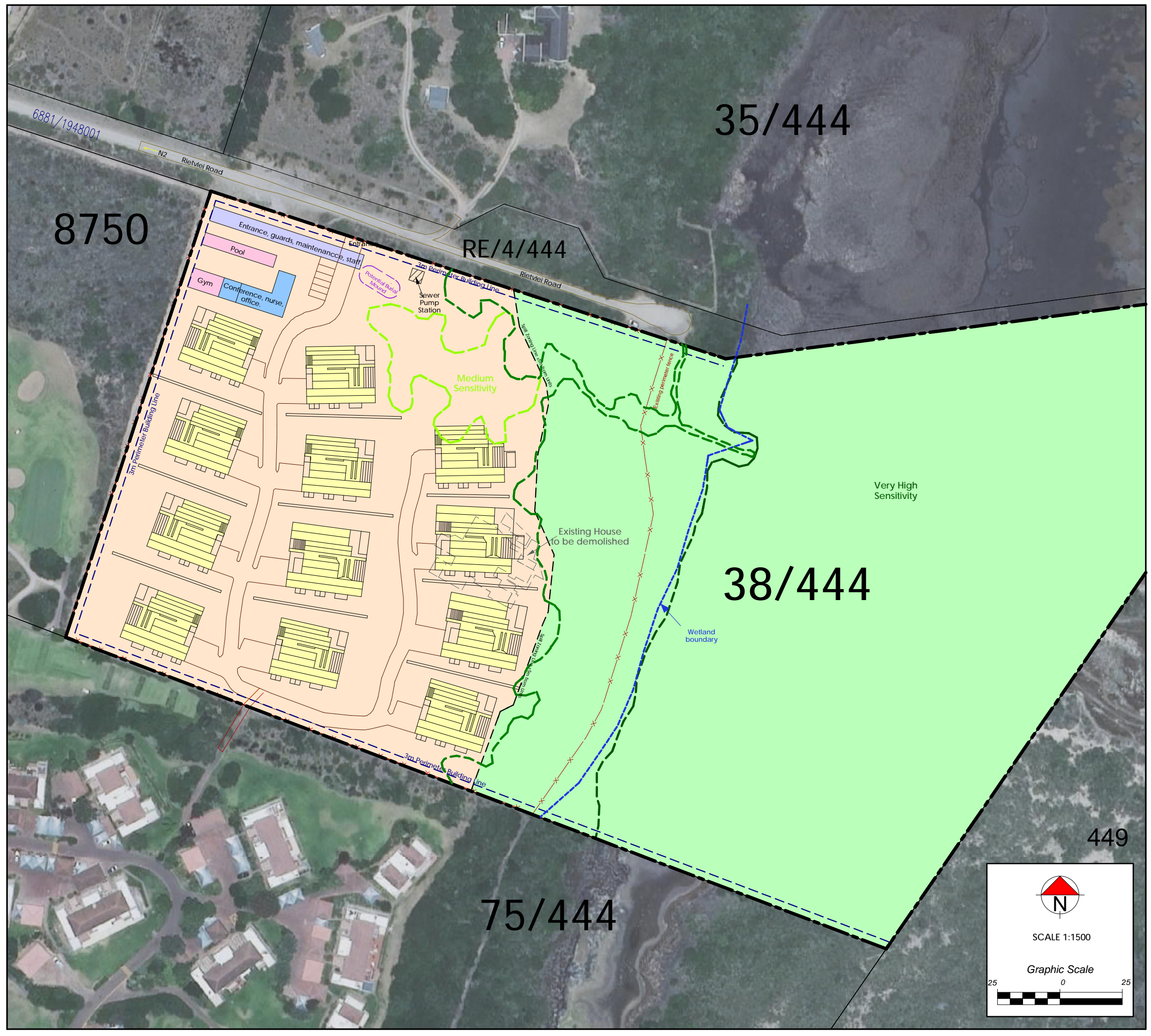
Figure 3 – Distribution of Traffic Generated by the Development

Figure 4 – Estimated 2028 AM/PM Peak Hour Traffic Volumes (including traffic growth and Proposed Development)



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Locality Plan



**PORTION 38 OF THE FARM
GANSESVALLEI NO 444**

SITE DEVELOPMENT PLAN

LEGEND:

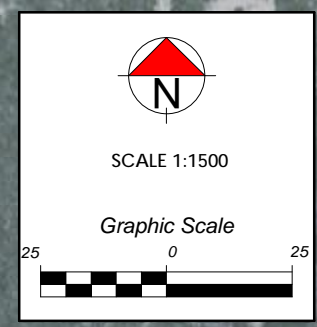
ZONING	QTY	HA	%
Residential Zone II (Group housing)	1	3.17	36.9
Open Space Zone III (Nature reserve)	1	5.41	63.1
Medium Sensitivity Area			
High Sensitivity Area			
Very High Sensitivity Area			
Wetland Boundary			
TOTAL	2	8.58	100

- NOTES**
- For erf data, refer SG6687/1948
 - Sizes & dimensions are approximate and subject to final survey
 - 1m contour intervals based on Contour Plan from SJM Surveys dated October 2008
 - (12) x Sectional Title Group Housing Units (655m² each)
 - 3m Perimeter Building Lines proposed
 - (2) x Garage bays / unit
(6) x Visitor parking bays
 - Density (max 20u/ha) = 1.399 u/ha
 - Communal Open Space (min 80m²/unit) = > 7 ha
 - Internal Road Width = 5m

DRAWN:	HL	CHECKED:	MV
PLAN NO:	Pr22/11/F444Ptn38/SDP07		
PLAN DATE:	6 Nov 2023		
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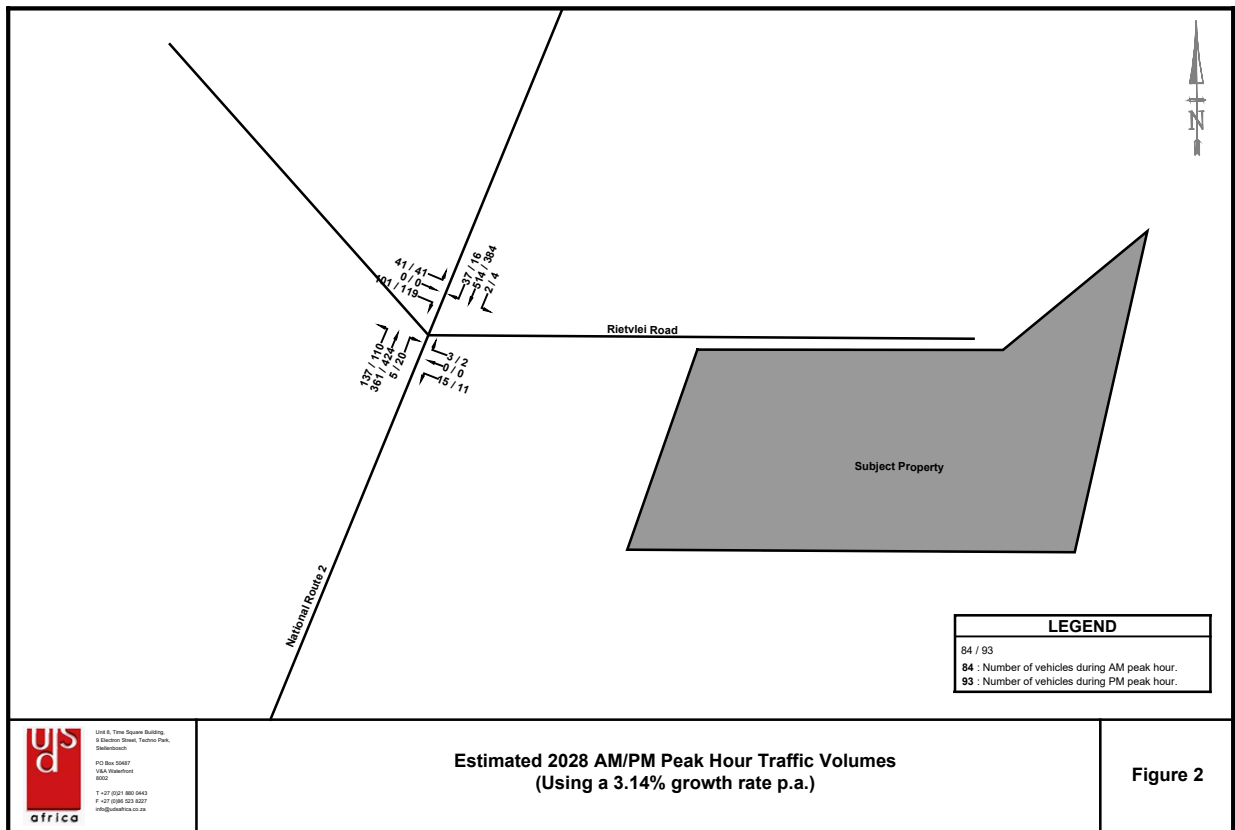
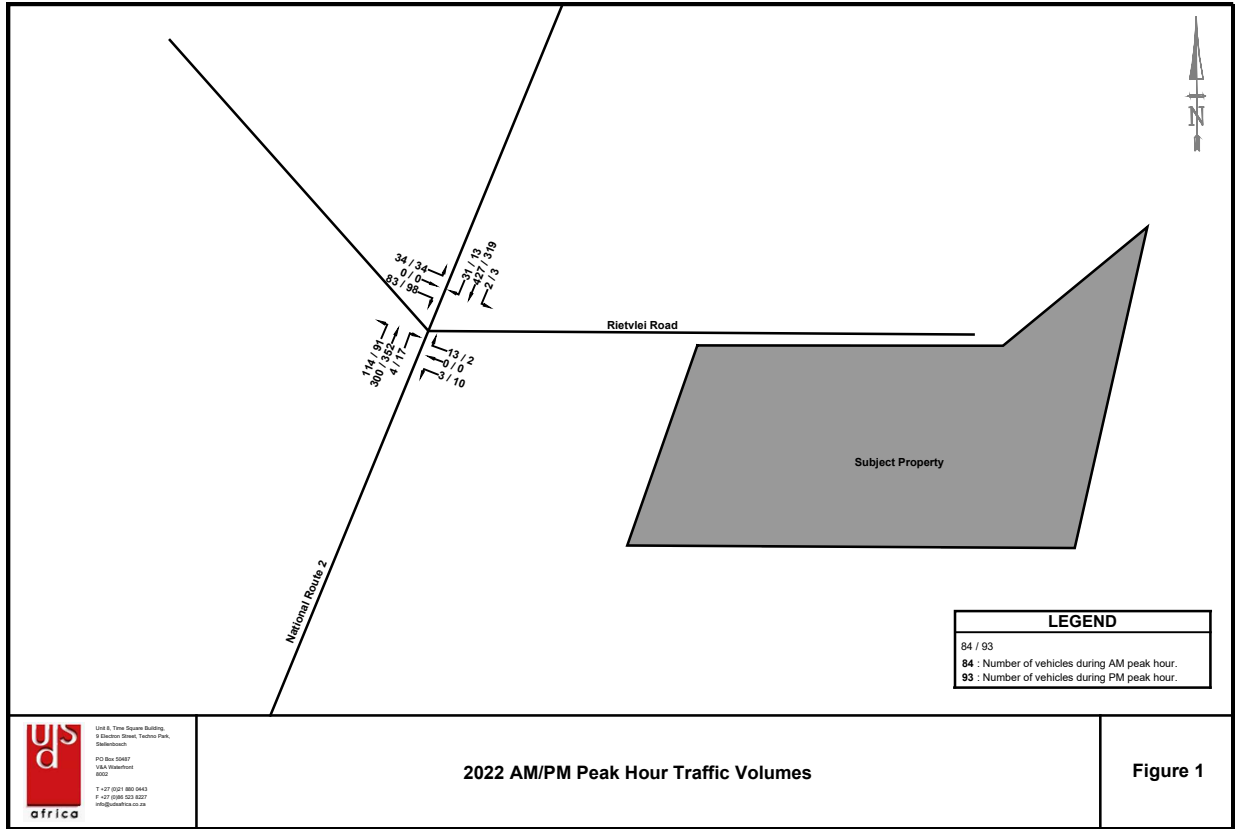
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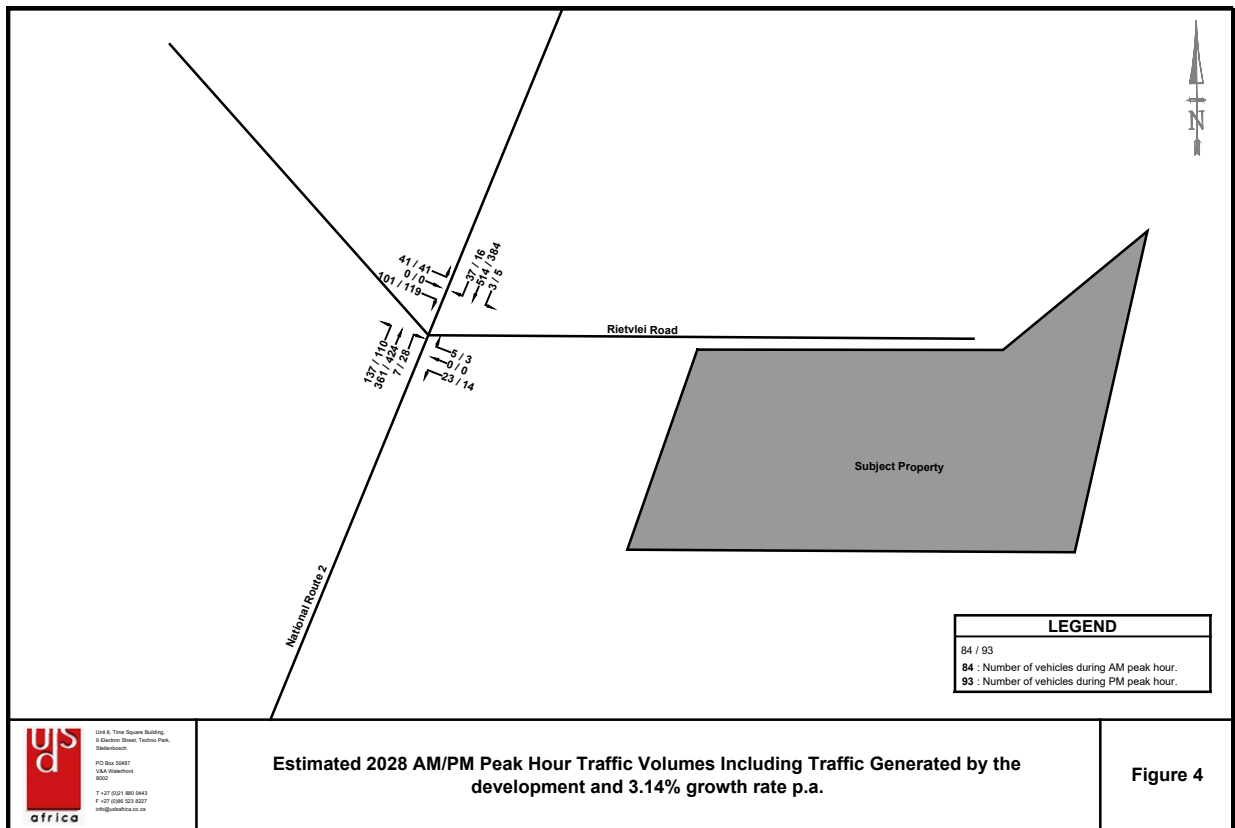
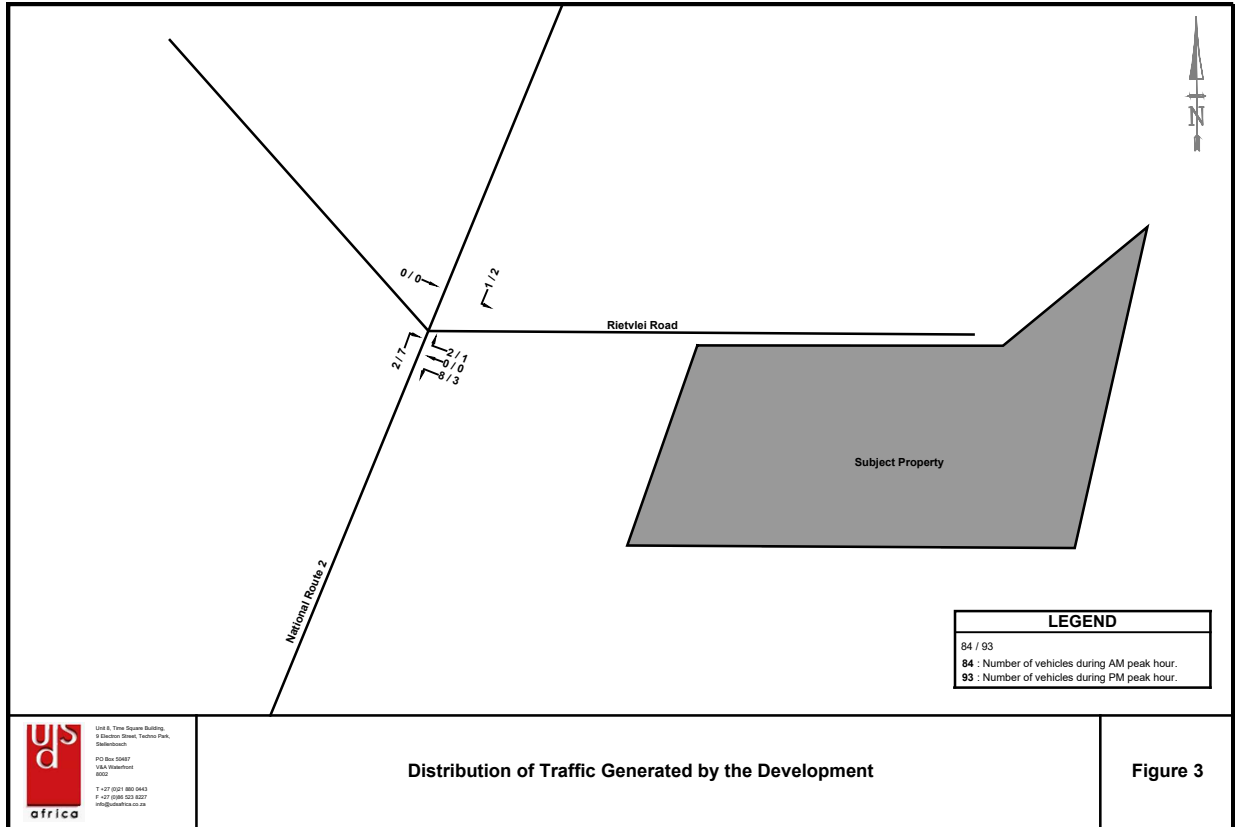


Marike Vreken STADS & OMGEWINGSPLANNERS
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Ref: TPW/CFS/RP/LUD/REZ/SUB – 22/138 (Job 18762)

The Manager: Land Use Management
Bitou Municipality
Private Bag X1002
PLETTENBERG BAY
6600

Attention: Mr C Schliemann

Dear Sir

PROPOSED REZONING: PORTION 38 OF FARM GANSE VALLEY 444, BITOU MUNICIPALITY

1. The following refer:
 - 1.1. Your letter 18/38/444 dated 8 November 2022 to "Sir/Madam".
 - 1.2. Ms B Lotz's e-mail of 16 February 2023 on behalf of Marike Vreken Town Planners to Mr E Burger at this Branch.
 - 1.3. Mr E Burger's e-mail of 16 February 2023 on behalf of this Branch to Ms B Lotz at Marike Vreken Town Planners.
2. Minor Road 7214 (OP07214), for which this Branch is the Road Authority, is affected by this application.
3. This Branch offers no objection to this development, provided that the following are adhered to:
 - 3.1. The development is limited to 17 single storey sectional title group housing units, up to 6 bedrooms each, with communal buildings, entrance gate, guard house, maintenance and staff room, clubhouse, gym, conference room, doctor or nurse's office and administrative office, and a private nature reserve, all as depicted on the "SDP".
 - 3.2. The existing access off OP07214 at ±km0.51 RHS ("Right Hand Side") must be permanently closed by the future wall or fence that will be erected around the gated development.

- 3.3. A new access off OP07214 at \pm km0.53 RHS s must be created as proposed. This access will serve as the only access off OP07214 in favour of this proposed development, no other access off OP07214 may be created or continue to exist.
- 3.4 The new access off OP07214 at \pm km0.53 RHS in favour of this proposed development must be designed, by an adequately registered civil engineering professional, in accordance to this Branch's standards before submitting those design drawings to this Branch's Chief Design Directorate (Attention: Mr M Hendrickse; e-mail: Michael.Hendrickse2@westerncape.gov.za) for approval before construction thereof may commence. This access design must include:
 - 3.4.1 Enough stacking distance between the edge of shoulder of OP07214 and the vehicular gate structure. This stacking distance must be indicated.
 - 3.4.2 Sight distances along and within the road reserve of OP07214 that complies to this Branch's minimum safe standards.
- 3.5 If external services will be proposed to be constructed within the road reserve or within the adjacent 5m Building Line (Roads Ordinance 19 of 1976) of OP07214, such planning must be cleared with this Branch (Attention: Mr E Burger; e-mail: Evan.Burger@westerncape.gov.za) before designs and requests for such wayleave approvals may be submitted.
- 3.6 If refuse will not be collected at each residence and the communal buildings within the development, then a refuse removal area must be provided within the proposed development and not within the road reserve of OP07214.
- 3.7 No additional stormwater runoff (pre- versus post development scenarios) may be discharged into the road reserve of OP07214.
- 3.8 Approval must be obtained from this Branch to construct a (security) wall or fence along the road reserve boundary of OP07214 if different from this Branch's standard for fences.
- 3.9 No structures may be constructed within the 5m Building Line (Roads Ordinance 19 of 1976) adjacent to OP07214.
- 3.10 It must be entered into the Body Corporate's set of rules, and accepted by all the property owners or tenants, that this Branch is not obliged to maintain a Minor Road - such as OP07214, and that this Branch will not increase on its maintenance along OP07214 due to this development being supported. It is however recommended by this Branch that the gravelled road section be upgraded by the developer, with a permanent (tarred) surfacing up to at least the new access of this development.

- 3.11 SANRAL is requested to provide their input and approval where affected at the N2/OP07214-intersection.
- 3.12 The developer accepts to cover all the design and construction costs towards the establishment of this proposed development.

Yours Sincerely



SW CARSTENS

For DEPUTY DIRECTOR-GENERAL: ROADS

DATE: 9 March 2023

ENDORSEMENTS

1. Bitou Municipality
e-mail: townplanning@plett.gov.za

2. Marike Vreken Town Planners

Attention: Ms M Vreken (e-mail: info@vreken.co.za)

3. Garden Route District Municipality

Attention: Mr JG Daniels (e-mail)

4. District Roads Engineer, Oudtshoorn

5. Mr SW Carstens (e-mail)

6. Mr E Burger (e-mail)

7. Mr M Hendrickse (e-mail)

8. Mr J van der Merwe (e-mail)

Appendix C: Municipal Services Capacity Analysis (GLS Consulting)



3 October 2022

The Director: Engineering Services
Bitou Municipality
Private Bag X1002
Plettenberg Bay
6600

Attention: Ms Asiphe Mgoqi

Dear Madam,

**PROPOSED RESIDENTIAL DEVELOPMENT ON PORTION 38 OF FARM 444, PLETTENBERG BAY:
CAPACITY ANALYSIS OF THE BULK WATER & SEWER SERVICES**

The request by Mr Francois Scholtz of Tuiniqua Consulting Engineers for GLS Consulting to investigate and comment on the bulk water supply and sewer discharge of the proposed development (residential development on Portion 38 of Farm 444, Plettenberg Bay), refers.

This document should inter alia be read in conjunction with the Water Master Plan (performed for the Bitou Municipality) dated June 2020 and the Sewer Master Plan dated June 2020.

The proposed development on Portion 38 of Farm 444 was not taken into consideration for the June 2020 master plans for the water and sewer networks.

1 WATER DISTRIBUTION SYSTEM

1.1 Distribution zone

The master plan indicated that the proposed development area should be accommodated in the existing Goose Valley reservoir zone. The proposed connection to the existing water system is to the existing 75 mm Ø water pipe to the northwest of the proposed development in Rietvlei Road, as shown on Figure 1.

The proposed development is situated inside the water priority area.

1.2 Water demand

No allowance was made in the June 2020 water master plan for development on Portion 38 of Farm 444.

For this re-analysis, the average annual daily demands (AADD) and fire flow for the proposed development were calculated and classified as follows:

- 17 Residential units @ 0,6 kL/d/unit = 10,2 kL/d
- Fire flow criteria (Low risk) = 15 L/s @ 10 m

GLS Consulting (Pty) Ltd

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Reg no: 2007/003039/07

www.gls.co.za

Directors: HA Baartman, AG Hingeston

1.3 Present situation

1.3.1 Reticulation network

The Goose Valley water distribution zone is supplied with water from the Goose Valley reservoir (Top Water Level (TWL) of 89.7 m above mean sea level (m a.s.l.)) through a 250 mm Ø main supply pipe under gravity. The existing water reticulation system however also supplies bulk water to the Wittedrift and Matjiesfontein reservoirs (through the reticulation network, see section 1.3.3 further on in the report) and has consequently insufficient capacity to accommodate any additional developments in the supply area in order to comply with the pressure and fire flow criteria as set out in the master plan.

It is proposed in the water master plan that bulk supply to the Matjiesfontein and Wittedrift reservoirs are supplied via a dedicated bulk system from the Town reservoirs, which will consequently free up capacity in the existing Goose Valley reticulation system to accommodate the proposed development.

Upgrading of the 75 mm Ø water pipeline in Rietvlei Road to a 110 mm diameter pipeline is also proposed to comply with the fire flow criteria.

Network upgrade

- Item 1 : 220 m x 110 mm Ø replace existing 75 mm Ø pipe = R 221 000 *

(* Including P & G, Contingencies and Fees, but excluding VAT - Year 2021/22 Rand Value. This is a rough estimate, which does not include major unforeseen costs).

1.3.2 Reservoir capacity

Bulk water is currently supplied from the Goose Valley reservoir to the Matjiesfontein and Wittedrift reservoirs, which has a negative effect on the available reservoir storage capacity available for the Goose Valley reservoir supply area (this is discussed in section 1.3.3 of this report further on).

The Matjiesfontein reservoir is the main supply reservoir for the areas east of the Keurbooms River and the Wittedrift reservoir is the main supply reservoir for Wittedrift and Green Valley.

The Goose Valley reservoir has consequently insufficient spare capacity to accommodate any additional developments.

Note: The Goose Valley reservoir will have sufficient spare capacity available to accommodate the development if the Wittedrift and Matjiesfontein reservoirs are supplied with water directly from the Town reservoirs through a dedicated bulk system, as discussed in paragraph 1.4.1 further on in the report.

1.3.3 Bulk supply

The Plettenberg Bay bulk water system was designed to supply the Wittedrift and Matjiesfontein reservoirs with bulk water from the Town reservoirs, located on the Plettenberg Bay Water Treatment Plant (WTP) site, and the Goose Valley reservoir with bulk water through the Goose Valley PS, also located at the Plettenberg Bay WTP site.

The Matjiesfontein reservoir was supplied with water through a 150 mm diameter dedicated pipeline between the Town reservoirs and the Matjiesfontein reservoir, and the Wittedrift reservoir through a 90 mm diameter pipe that connects to the Town/Matjiesfontein pipeline.

The 150 mm supply pipe to the Matjiesfontein and Wittedrift reservoirs is however at capacity (capacity of pipeline is ±1,0 ML/d and peak demand of the supply system is currently ±2,3 ML/d) and bulk supply to the Matjiesfontein and Wittedrift reservoirs is therefore currently supplied from the Goose Valley reservoir through the network of the Goose Valley water distribution zone. The

Goose Valley reticulation network connects to the Matjiesfontein bulk pipeline before the bridge over the Keurbooms River.

The system is therefore currently not operated as it was designed for. The current operation consequently puts pressure on the available spare capacity of the Goose Valley system and is also not economically the best solution for the longer term (water that could have gravitated to the Matjiesfontein reservoir is currently pumped via the Goose Valley system).

The Goose Valley reservoir is supplied with water through a 200 mm diameter dedicated pipe between the Goose Valley PS and reservoir

The capacity of the existing Goose Valley PS and accompanying 200 mm supply pipeline is 40 L/s (3,4 ML/d if pumped 24 hours a day). Peak demand from the Plettenberg Bay WTP to the Goose Valley reservoir is calculated at 2,7 ML/d (based on bulk water readings of the Goose Valley PS supplied by Bitou Municipality from July 2020 to March 2022). This implies that during peak demand conditions (December holiday) the Goose Valley PS should be operational 19 hours a day in order to supply the demand.

Bitou Municipality has indicated that their Goose Valley bulk system is under pressure during peak demand conditions and that the larger bulk system (supply to Matjiesfontein reservoir) should be upgraded according to the master plan before additional developments can be accommodated within the existing Goose Valley reservoir supply area.

1.4 Implementation of the master plan

1.4.1 Bulk supply

In the water master plan the following upgrades are proposed in order to augment the existing bulk supply system between the Town reservoirs at the WTP site and the Matjiesfontein reservoir on the eastern side of the Keurbooms River:

Bulk supply augmentation

• BPW.B39	: 930 m x 400 mm Ø new bulk pipe (replace 150 mm Ø)	= R	5 264 000 *
• BPW.B67	: 2 670 m x 355 mm Ø new bulk pipe (replace 150 mm Ø)	= R	11 903 000 *
• Item 3	: Close existing isolating valve	= R	No cost
		Total = R	17 167 000 *

In the Water Master Plan item DPW.B40 was proposed to connect an existing 300 mm Ø pipeline from the Town reservoir zone to the existing 150 mm Ø Matjiesfontein bulk pipeline (at the intersection of the N2 National Road and the service Road towards the Goose Valley reservoir), in order to augment bulk water supply to the Matjiesfontein and Wittedrif reservoirs.

Bitou Municipality has however indicated that this 300 mm Ø pipeline (3,6 km asbestos cement pipeline from the Town reservoirs) is in a poor condition, has been abandoned and can not be utilised to augment the bulk water supply system. The master plan should therefore be amended to reflect this.

It is therefore proposed that the following master plan item is included in the water master plan in the place of the existing 300 mm Ø AC pipeline.

• Item 2	: 3 600 m x 400 mm Ø new bulk pipe (replace 300 mm Ø)	= R	19 515 000 *
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These upgrades will solve the existing backlog of bulk supply to the Matjiesfontein reservoir as well as provide spare capacity for potential future development area, as documented in the water master plan.

(* Including P & G, Contingencies and Fees, but excluding VAT - Year 2021/22 Rand Value. This is a rough estimate, which does not include major unforeseen costs).

Take note that the route of the proposed pipeline is schematically shown on Figure 2 attached, but has to be finalised subsequent to a detail pipeline route investigation.

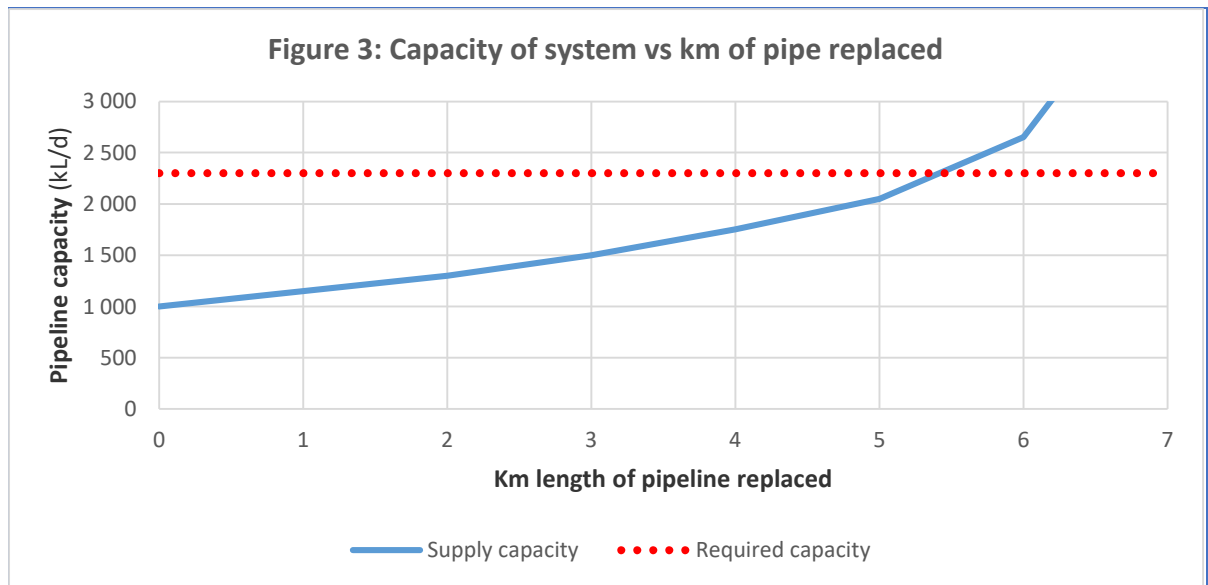
1.4.2 Minimum requirements

The capacity of the existing bulk supply system from the Town reservoirs to the Matjiesfontein reservoir is calculated at 1,0 ML/d. The required supply to the Matjiesfontein reservoir during peak holiday periods is calculated at 2,3 ML/d (refer to paragraph 1.3.3).

It is therefore proposed that the abandoned 300 mm Ø pipeline from the Town reservoirs to the existing 150 mm Ø Matjiesfontein bulk pipeline (at the intersection of the N2 National Road and the service Road towards the Goose Valley reservoir) and the existing 150 mm Ø Matjiesfontein bulk pipeline (from where the 300 mm Ø abandoned pipeline ends towards the bridge over the Keurbooms River) is replaced and isolated from the existing Goose Valley network as proposed in the water master plan, in order to augment supply to the Matjiesfontein reservoir.

This will then alleviate pressure that currently exist on the supply to the Goose Valley reservoir in order to accommodate future developments within the reservoir supply area.

Figure 3 below shows how supply to the Matjiesfontein reservoir will improve as sections of master plan items 2, BPW.B39 and BPW.B67 are implemented (from the Town reservoir towards the Keurbooms River):



Roughly 5,5 km of the existing 7,7 km bulk pipeline between the Town reservoirs and the Keurbooms River should be upgraded in order to supply the Matjiesfontein reservoir from the Town reservoirs under gravity (no augmentation of bulk supply from the Goose Valley reservoir will then be required).

The minimum upgrades required to improve the existing bulk supply system in order to accommodate the proposed development in the existing system are:

- Master plan item 2 (3,6 km x 400 mm Ø replace existing 300 mm Ø abandoned AC pipe).
- Master plan item BPW.B39 (0,9 km x 400 mm Ø replace existing 150 mm Ø bulk pipe).
- Portion of master plan item BPW.B67 (1,0 km x 355 mm Ø replace existing 150 mm Ø bulk pipe).

2 SEWER NETWORK

2.1 Drainage area

The master plan indicated that the proposed development should be accommodated within the existing Goose Valley Main pumping station (PS) drainage area. A new internal PS is proposed at the northern boundary of the proposed development (Rietvlei Road) from where sewage should be pumped to a new gravity sewer along the N2 National Road, from where sewage should gravitate towards the Goose Valley Main PS.

Sewage is currently pumped from the Goose Valley Main PS via a 200 mm Ø rising main to the Ganse Valley Wastewater Treatment Plant (WWTP), as shown on Figure 4 attached.

The proposed development is situated inside the sewer priority area.

2.2 Sewer flow

No allowance was made for the proposed development on Portion 38 of Farm in the June 2020 sewer master plan.

For this re-analysis of the master plan, the peak daily dry weather flow (PDDWF) for the proposed development was calculated as 7,1 kL/d.

2.3 Present situation

The existing Goose Valley Main PS (capacity of 21 L/s) with an accompanying 200 mm Ø rising main have sufficient capacity to accommodate the proposed development.

New link services infrastructure will however be required to connect the proposed development on Farm 444/38 to the existing sewer system, as shown on Figure 4:

Link services items

- Item 4: New private pump station
- Item 5: New private rising main
- Item 6: 120 m x 160 mm Ø new outfall sewer
- Item 7: 445 m x 250 mm Ø new outfall sewer

The routes of the items above are schematically shown on Figure 4, but have to be finalised subsequent to detailed pipeline route investigations.

2.4 Minimum requirements

The minimum items required to accommodate the proposed development in the existing Plettenberg Bay sewer system are link services items 4, 5, 6 & 7 to connect the internal sewer system of the proposed development to the existing Plettenberg Bay sewer system.

3 CONCLUSION

The developer of Portion 38 of Farm 444 in Plettenberg Bay may be liable for the payment of a Development Contribution (as calculated by Bitou Municipality) for bulk water and sewer infrastructure as per Council Policy.

The master plan indicated that the proposed development area should be accommodated in the existing Goose Valley reservoir zone. The proposed connection to the existing water system is to the existing 75 mm Ø water pipe to the northwest of the proposed development in Rietvlei Road, as shown on Figure 1. Upgrading of the 75 mm Ø water pipeline in Rietvlei Road to a 110 mm diameter pipeline is proposed to comply with the fire flow criteria.

The bulk water system to the Goose Valley, Wittedrift and Matjiesfontein reservoirs is at capacity and should be upgraded according to the master plan before additional developments within the reservoir supply areas can be accommodated.

The minimum upgrades required to improve the existing bulk supply system (in order to accommodate the proposed development in the existing system), are:

- Master plan item 2 (3,6 km x 400 mm Ø replace existing 300 mm Ø abandoned AC pipe).
- Master plan item BPW.B39 (0,9 km x 400 mm Ø replace existing 150 mm Ø bulk pipe).
- Portion of master plan item BPW.B67 (1,0 km x 355 mm Ø replace existing 150 mm Ø bulk pipe).

The master plan indicated that the proposed development should be accommodated within the existing Goose Valley Main pumping station (PS) drainage area. The existing Goose Valley Main PS (capacity of 21 L/s) with an accompanying 200 mm Ø rising main have sufficient capacity to accommodate the proposed development.

Link services items 4, 5, 6 & 7 will however be required to connect the internal sewer system of the proposed development to the existing Plettenberg Bay sewer system.

Also, find attached hereto Appendix A which includes general notes from Bitou Local Municipality regarding development approvals and conditions.

We trust that you find this of value.

Yours sincerely,

GLS CONSULTING (PTY) LTD
REG. NO.: 2007/003039/07



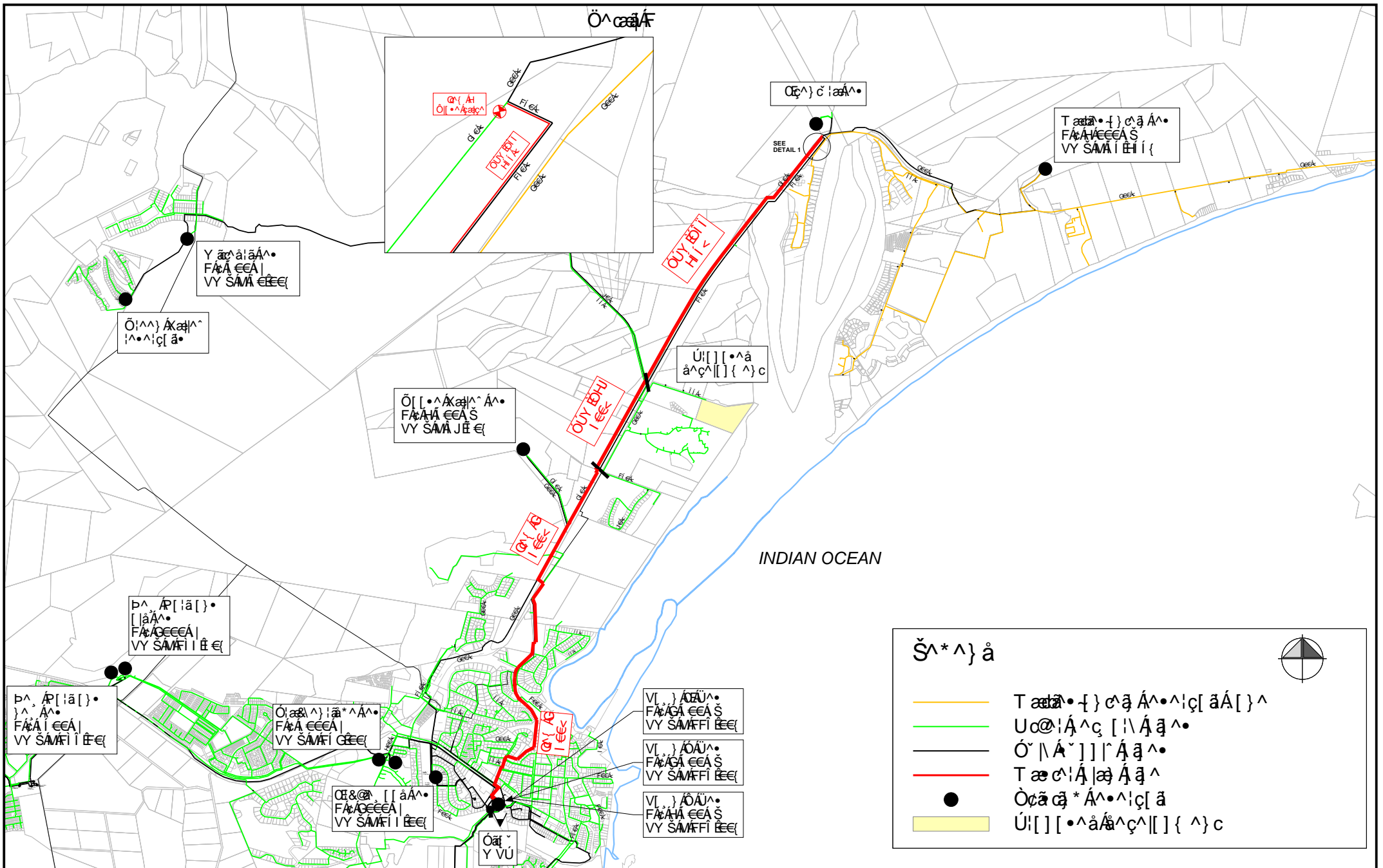
Per: PC DU PLESSIS

cc. Tuiniqua Consulting Engineers (Pty) Ltd
P.O. Box 544
Plettenberg Bay
6600

Attention: Francois Scholtz

GENERAL NOTES FROM BITOU LOCAL MUNICIPALITY ATTACHED TO GLS BULK WATER AND SEWER SERVICES CAPACITY REPORT

1. The GLS report is a services capacity report and the costs estimated in this report are only approximate values applicable at the time of the study.
2. Should the development be approved by Council the approval will be linked to certain development conditions. These conditions will be the official conditions applicable to the project and will take precedence over this report. Once approval is granted, Council will enter into a formal services agreement with the developer.
3. Costs for network upgrades, etc. As mentioned in the GLS report could change from time to time due to escalation, new tariff structures, additional requirements etc.
4. The Developer may be liable to pay a Development Contribution as per Council policy. The value payable will be calculated using Bitou Local Municipality's Development Contribution Calculator.
5. The Development Contribution monies are calculated according to the approved Council Policy at the time of payment.
6. The Development Contribution monies are payable before the approval of the building plan certificate or final approval of the subdivision for the transfer of units will be issued, as applicable for the type of development.
7. Where servitudes are required, all the costs and arrangements therefore will be for the developer's account.
8. The developer will be solely responsible for the cost of the link services as identified in the GLS report. The developer will also be responsible for the costs of upgrading to the minimum requirements of the services as identified in the GLS report. These costs may however be offset against the Development Contribution monies payable.
9. The above conditions are subject to any approved Council policies, which may be amended from time to time.



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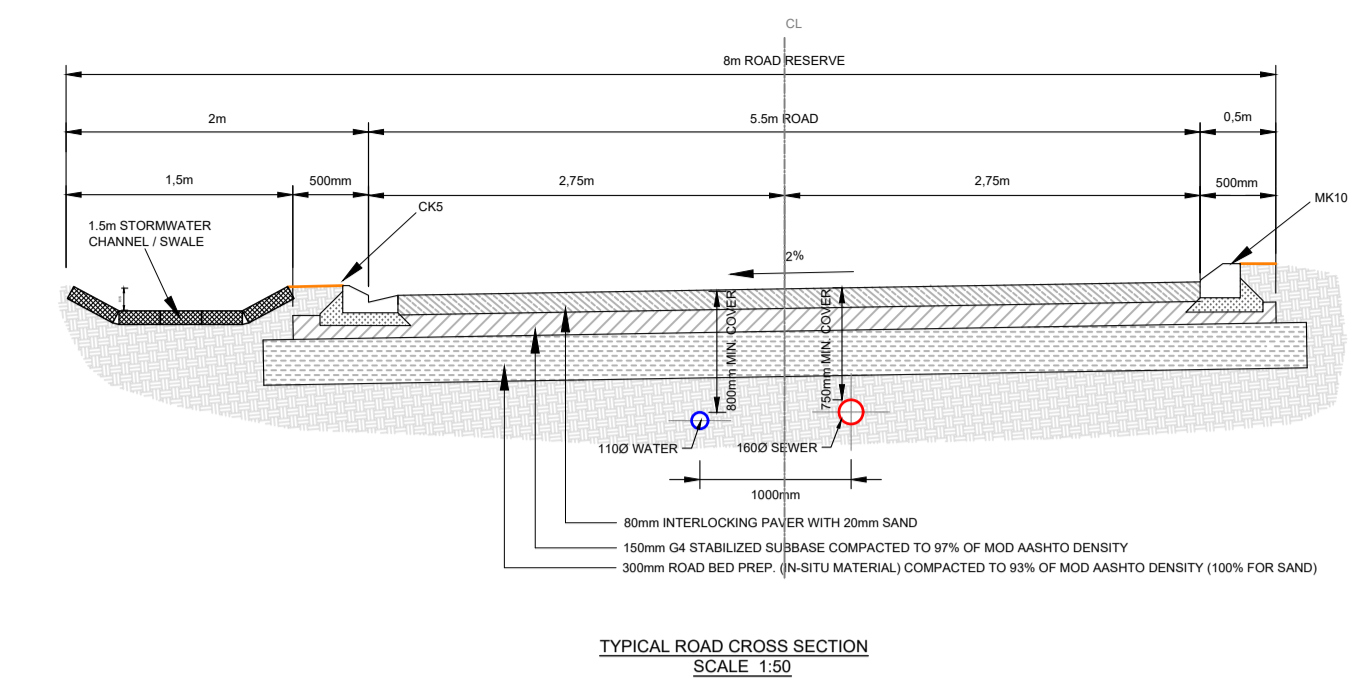
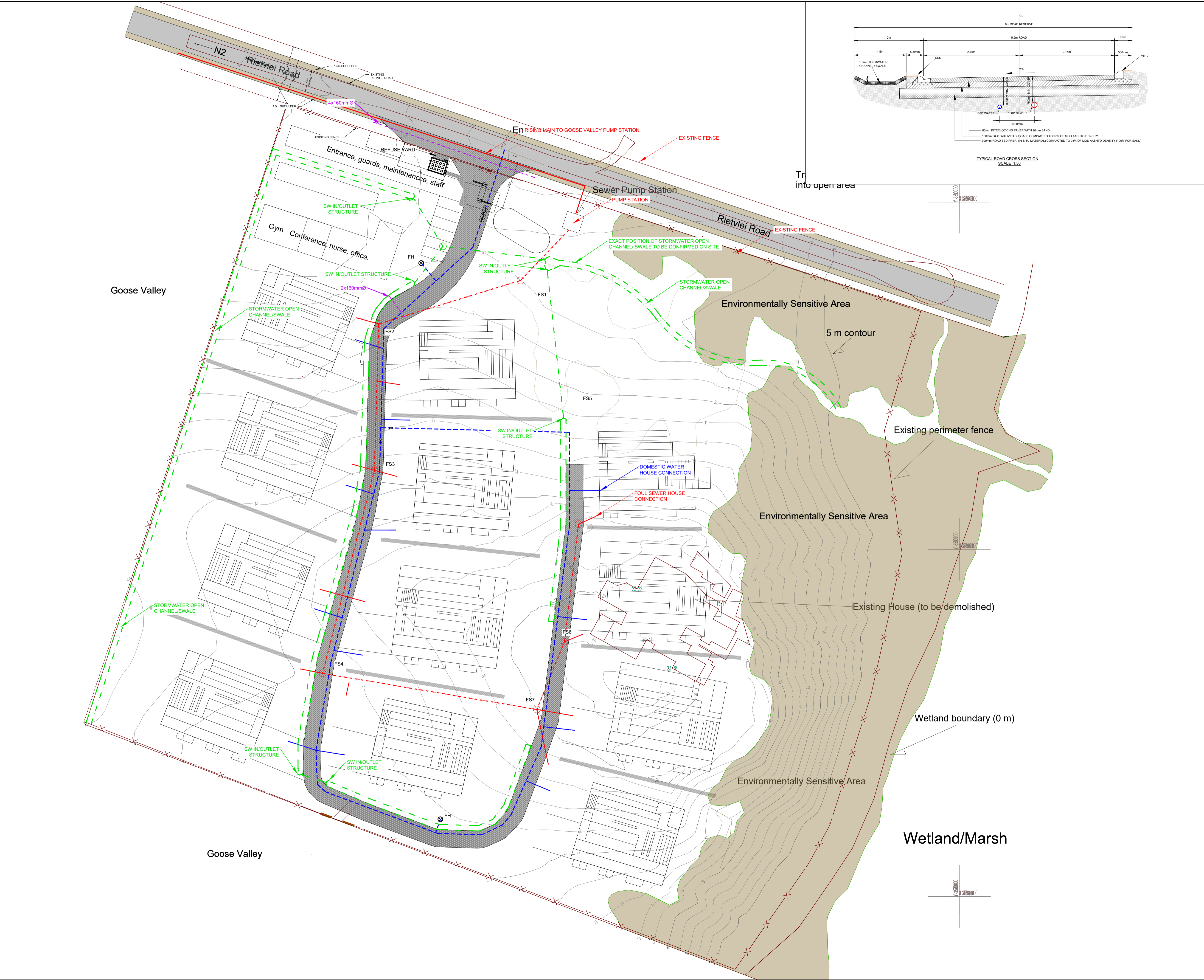


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Appendix D: Civil Engineering Services Layout (VITA Consulting)



CIVIL ENGINEERING SERVICES LEGEND

- 160mm Ø PVC-U 25.420m@1:46.2
- 160mm Ø FOULSEWER (uPVC Heavy Duty class 34) SLOPE AND LENGTH SHOWN
- FS9 FOUL SEWER MANHOLE COVER AND INVERT LEVEL SHOWN
- FOUL SEWER RISING MAIN
- POTABLE WATER SIZES AS SHOWN (PVC CLASS 12)
- FH GATE VALVE AND FIRE HYDRANT (TYPE 4)
- DOUBLE AND SINGLE ERF CONNECTIONS
- W2 WATER SETTING OUT NODES
- 1500mm WIDE STORMWATER CHANNEL
- STORMWATER LINE (SPIGOT & SOCKET CLASS 750) 375mm Ø (UNLESS OTHERWISE SHOWN)
- SW 1 SW MANHOLE
- SW HEAD & WINGWALL
- GENERAL SLEEVES (uPVC CLASS 6) SIZE AND NUMBER SHOWN

- GENERAL NOTES:**
- ALL WORK MUST BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATION SABS 1200 AND THE GENERAL CONDITIONS OF CONTRACT FOR THE CONSTRUCTION OF CIVIL ENGINEERING WORKS.
 - CO-ORDINATES ARE BASED ON THE W.G.S.84 SYSTEM.
 - THE CONTRACTOR HAS TO CHECK ALL SETTING OUT INFORMATION ON SITE AND NOTIFY THE ENGINEER OF ANY IRREGULARITIES PRIOR TO CONSTRUCTION.
 - ALL MODIFICATIONS TO EXISTING SERVICES AND DEVIATIONS FROM THE DESIGN TO BE AS PER INSTRUCTION FROM THE ENGINEER ONLY.
 - THE ENGINEER'S DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT'S, CONSULTANT'S AND SPECIALIST'S DRAWINGS - ANY DISCREPANCIES SHALL BE REFERRED TO THE ENGINEER PRIOR TO CONSTRUCTION.
 - COVER LEVELS TO CONFORM TO THE FOLLOWING:
 - TOP OF ROAD LEVELS INSIDE ROAD RESERVES
 - 75mm ABOVE NATURAL GROUND LEVEL IN NON-DEVELOPED AREAS
 - THE CONTRACTOR HAS TO ENSURE THAT THE COVER LEVELS TIES IN WITH THE SURROUNDING LEVELS AND NOTIFY THE ENGINEER OF ANY IRREGULARITIES
 - ERF CONNECTIONS:
 - POTABLE WATER- AND ELECTRICAL CONNECTIONS MAY BE BEND TO AVOID HORIZONTAL CLASHES WITH SHALLOW SERVICES
 - FOUL SEWER MUST BE VERTICALLY RE-ALIGNED TO AVOID HORIZONTAL CLASHES
 - CONNECTIONS MAY BE SHIFTED TO AVOID VERTICAL CLASHES

CONSULTING ENGINEER:
VITA CONSULTING ENGINEERS

House 51, Lourensveld Estate, Somerset West, 7130
 Tel: +27 84 207 3223, E-mail: niam@vitaeng.co.za

REV	DATE	DESCRIPTION	CHECKED
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B	03/11/2023	ISSUED FOR INFORMATION	GS

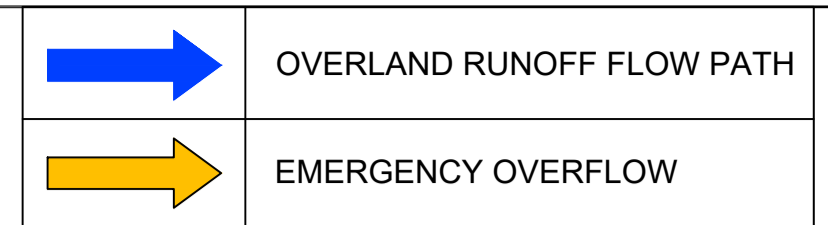
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PORTION 38 OF FARM 444, GANZVALLEY, PLETTEMBERG BAY

DRAWING TITLE
COMBINED SERVICES LAYOUT

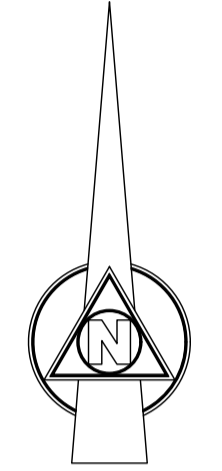
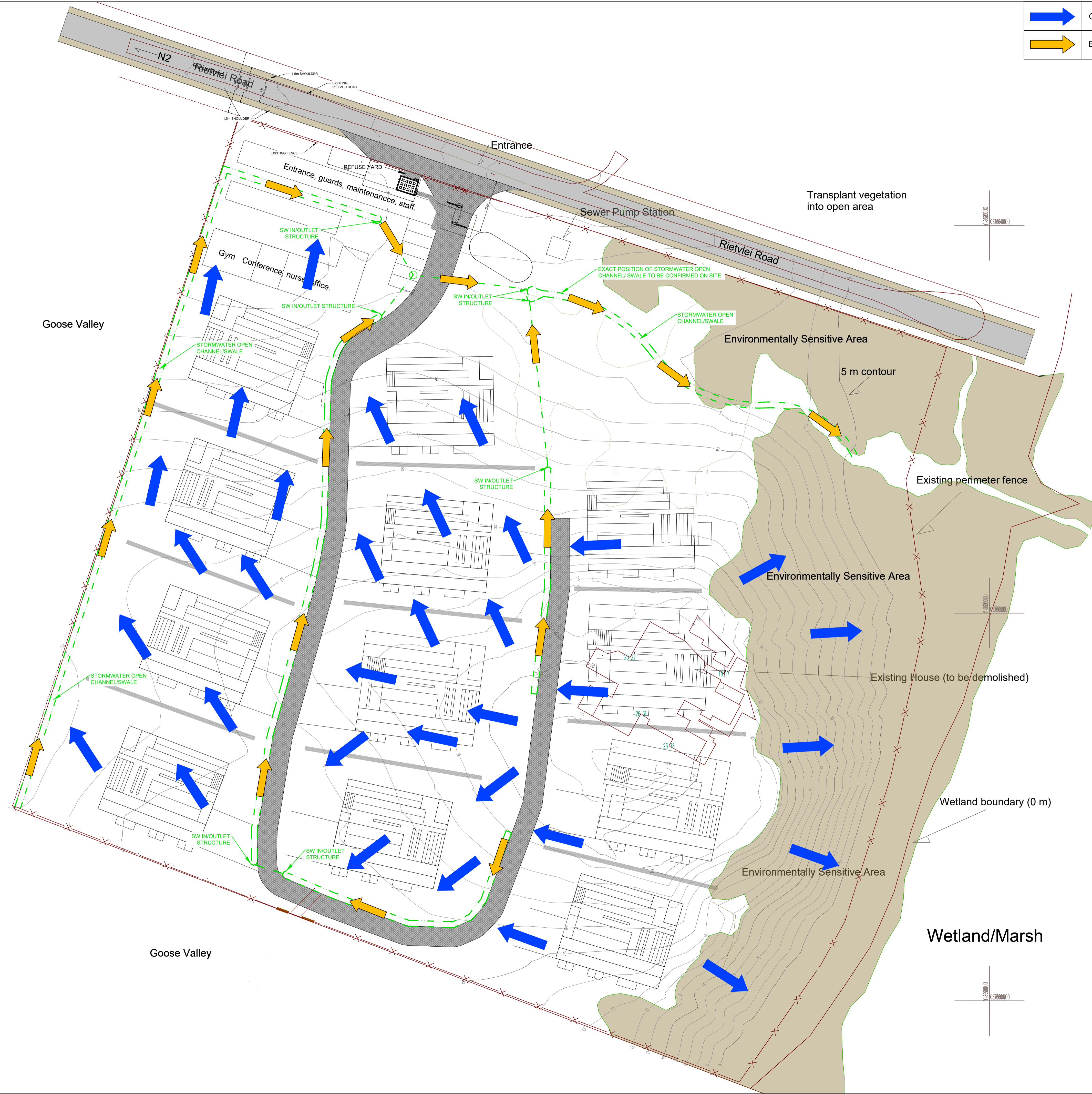
APPROVAL

SIGNATURE	NAME	R. van Dyk	01/09/2022
DATE	SCALE	SIZE	REV
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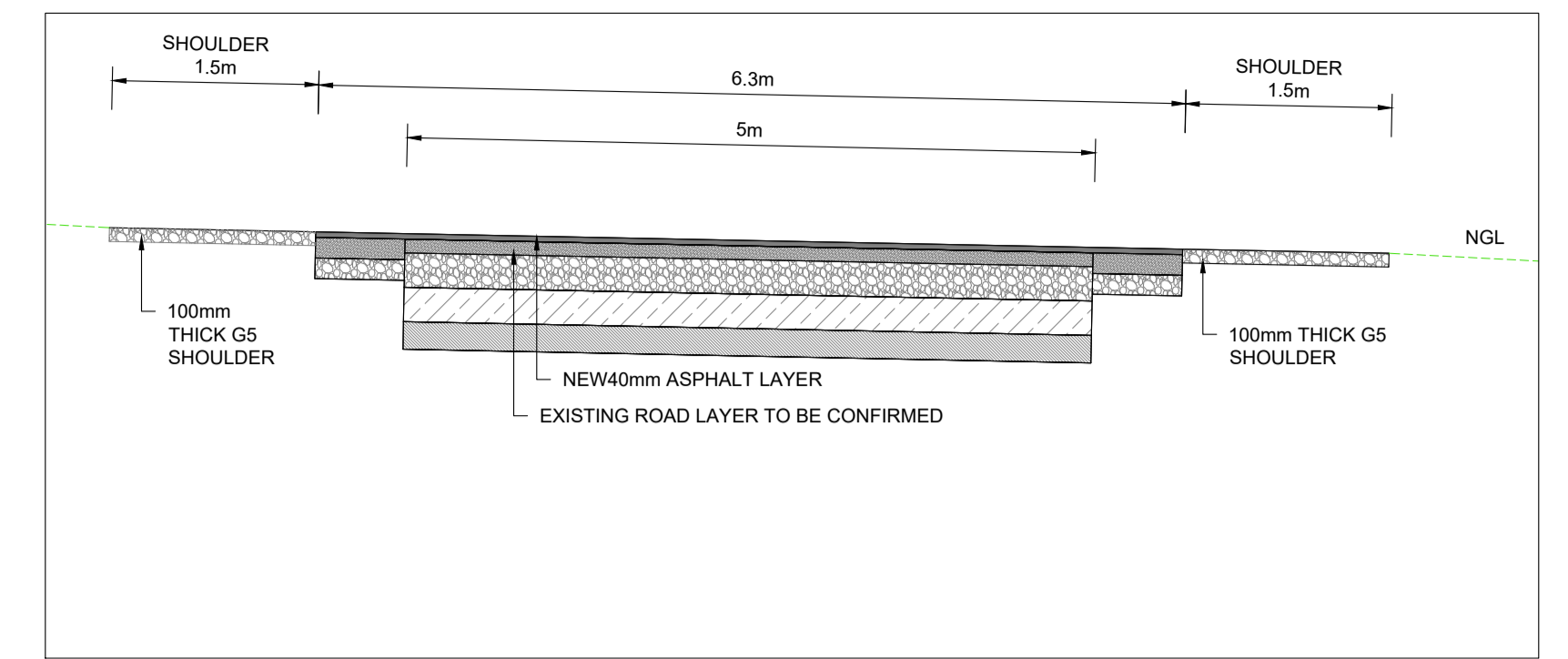
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TOTAL	= 3.94 Ha



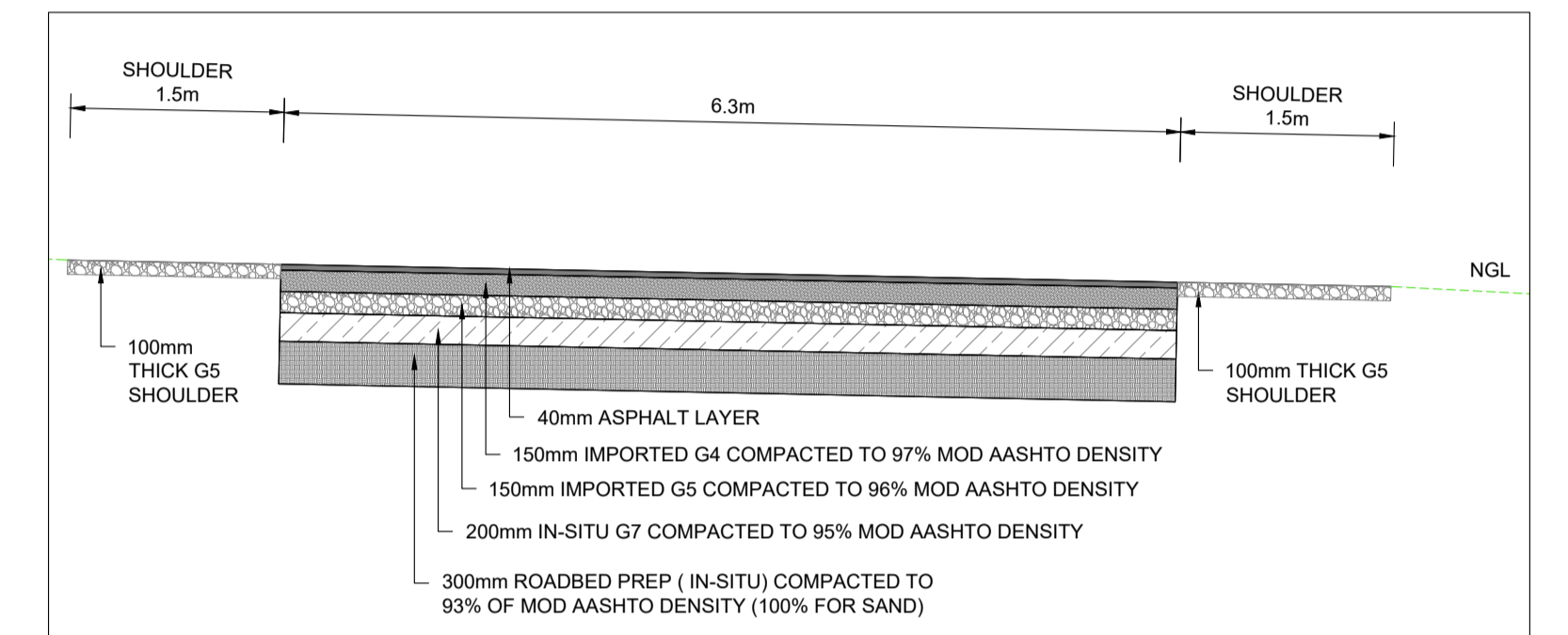
CONSULTING ENGINEER:			
VITA CONSULTING ENGINEERS			
House 51, Lourensdorf Estate, Somerset West, 7130 Tel: +27 84 207 3223, E-mail: niaan@vitaeng.co.za			
REV	DATE	DESCRIPTION	CHECKED
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B	03/11/2023	ISSUED FOR INFORMATION	GS
PROJECT NAME			
PORTION 38 OF FARM 444, GANZVALLEY, PLETTENBERG BAY			
DRAWING TITLE			
STORMWATER CATCHMENT AREA LAYOUT			
APPROVAL			
SIGNATURE:	R van Dyk	01/09/2022	DATE
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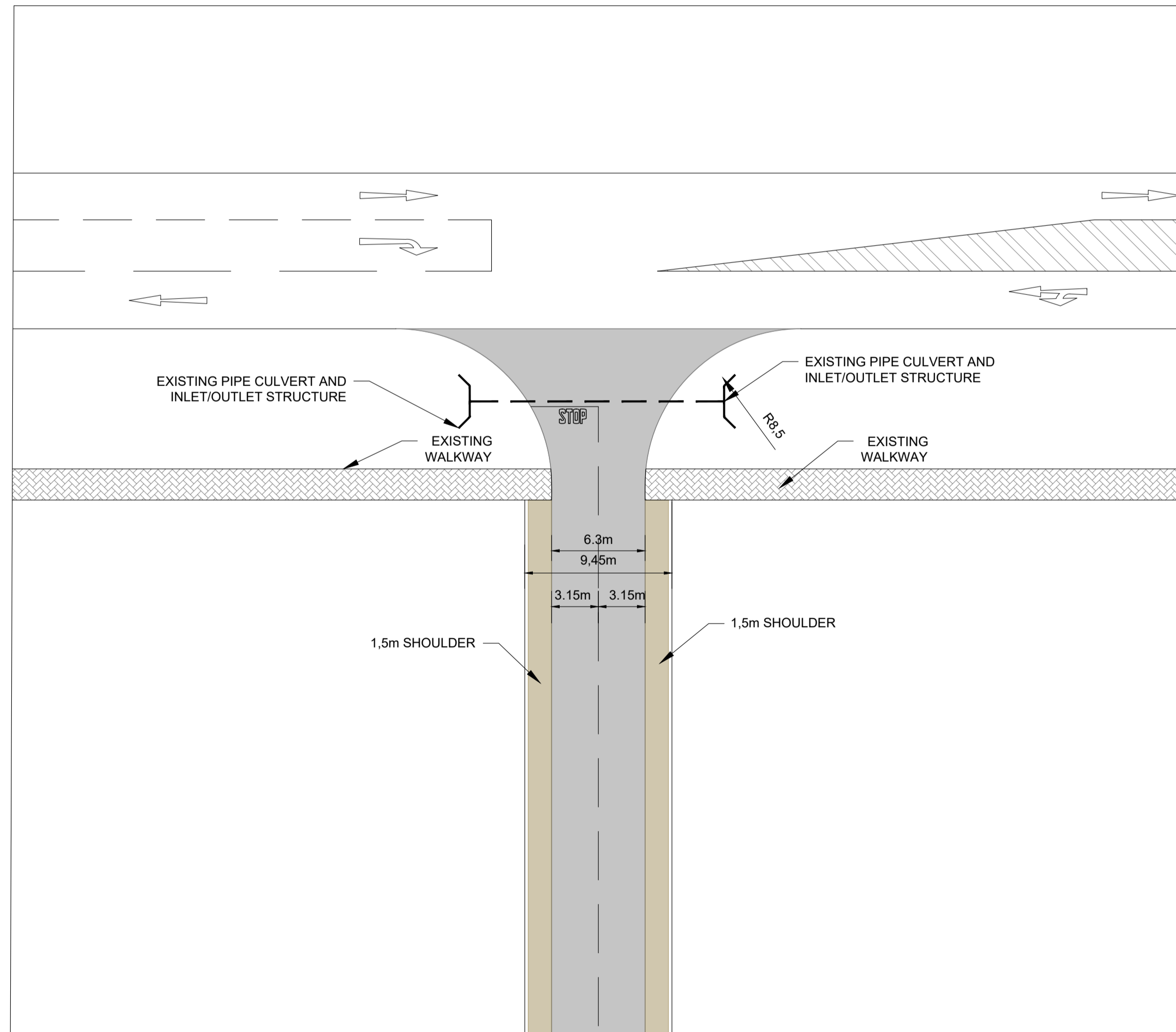
LOCALITY PLAN
N.T.S



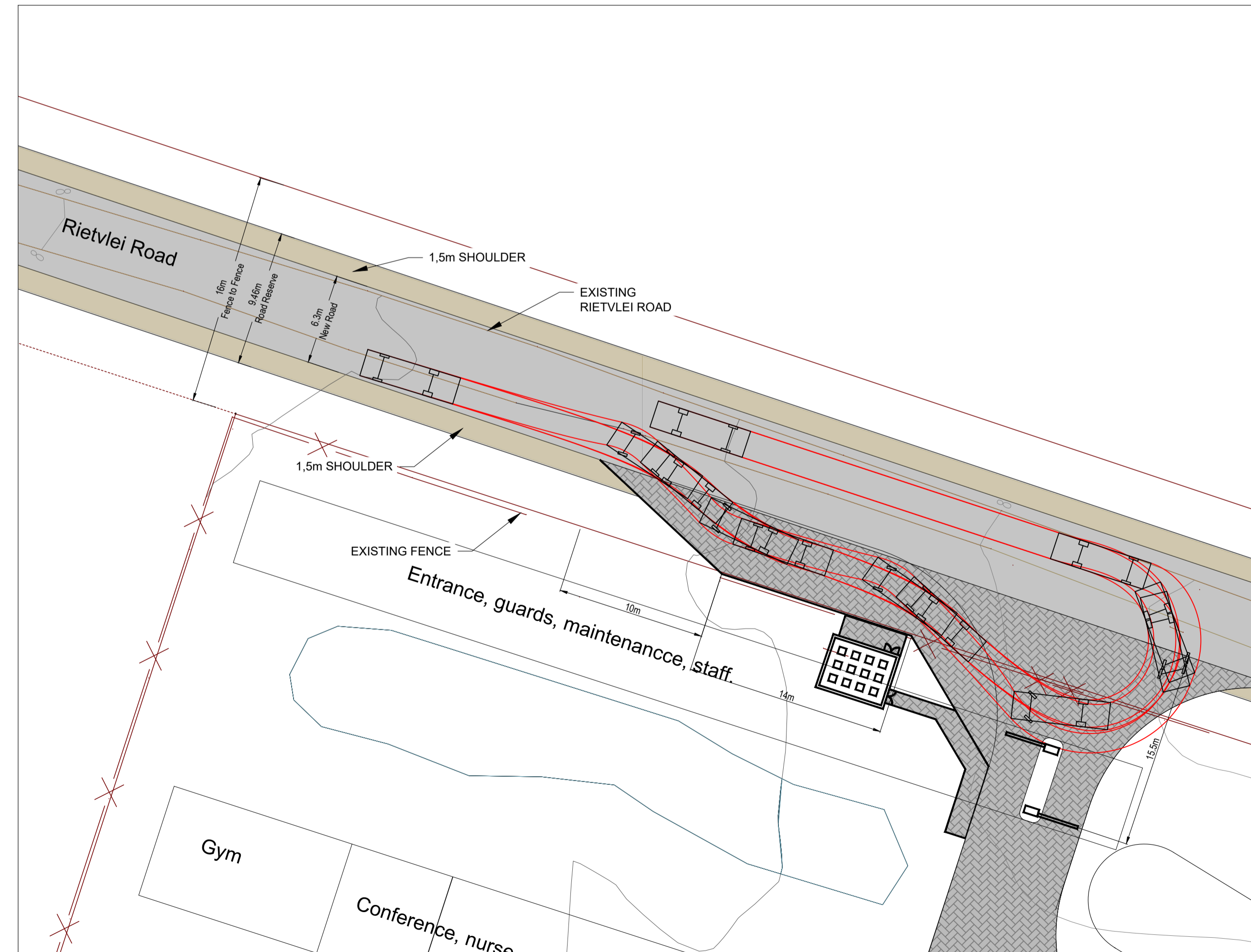
TYPICAL CROSS-SECTION THROUGH EXISTING ROADWAY (A-A)
N.T.S



TYPICAL CROSS-SECTION THROUGH NEW ROADWAY (B-B)
N.T.S



N2/RIETVLEI MINOR ROAD 7214 INTERSECTION
N.T.S



PROPOSED ENTRANCE FOR PORTION 38 OF FARM 444
N.T.S

- GENERAL NOTES:
- ALL WORK MUST BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATION SABS 1200 AND THE GENERAL CONDITIONS OF CONTRACT FOR THE CONSTRUCTION OF CIVIL ENGINEERING WORKS.
 - CO-ORDINATES ARE BASED ON THE W.G.S.84 SYSTEM.
 - THE CONTRACTOR HAS TO CHECK ALL SETTING OUT INFORMATION ON SITE AND NOTIFY THE ENGINEER OF ANY IRREGULARITIES PRIOR TO CONSTRUCTION.
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 - ERP CONNECTIONS:
 - POTABLE WATER- AND ELECTRICAL CONNECTIONS MAY BE BEND TO AVOID HORIZONTAL CLASHES WITH SHALLOW SERVICES
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 - CONNECTIONS MAY BE SHIFTED TO AVOID VERTICAL CLASHES

CONSULTING ENGINEER:
VITA CONSULTING ENGINEERS

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Tel: +27 84 207 3223, E-mail: niam@vitaeng.co.za

REV	DATE	DESCRIPTION	CHECKED
A	17/04/2023	ISSUED FOR INFORMATION	GS

PROJECT NAME
PORTION 38 OF FARM 444, GANSEVLEI, PLETTEMBERG BAY

DRAWING TITLE
UPGRADE OF MINOR ROAD 7214 (RIETVLEI ROAD)

APPROVAL

SIGNATURE: R van Dyk
NAME: DATE: 01/09/2022

DATE: 17/04/2023
SCALE: 1:500
SIZE: A1

DRAWING NO. 23009_ENT_01
REV A

Appendix E: Minutes of Bitou Engineering Department Meeting - 9
March 2023

Riaan van Dyk

From: Riaan van Dyk <riaan@vitaeng.co.za>
Sent: Monday, March 13, 2023 8:10 AM
To: 'Asiphe Masivuye Mgoqi'; 'Edward Charles Oosthuizen'
Cc: 'Lwamkelo Mapasa'
Subject: Plettenberg Bay Developments
Attachments: Portions 19 & 27 of Farm 444 - Figure 5(Draft).pdf; Portions 19 & 27 of Farm 444 - Figure 2(Draft).pdf

Good morning Asiphe/Eddie,

Thank you very much for taking time to meet on Thursday

I hereby wish to confirm the following items discussed during our meeting:

1) Appointment letters

- a. Bitou stated that they have had previous discussions with other consulting engineers regarding the developments on Farm 444/38 and Farm 304/32. RvD will submit appointment letters to Bitou to confirm his appointment as civil engineering consultant on the aforementioned developments.

2) Temporary water solution (refer figure 5)

- a. GLS provided a temporary solution (*installation of an additional 160mm bulk main off the existing 160mm distribution main in the N2 road reserve – refer figure 5*) which will free up an additional 860kl/day.
- b. This temporary solution formed the basis for the approval of the development on Farm 444/19 & 27, with specific conditions incorporated in the Service Level Agreement for the permanent solution.
- c. There is sufficient capacity in the 860kl/day to accommodate the developments on Farm 444/38, Farm 304/32 and erf 6503.
- d. The temporary solution should form the basis for the approval of the aforementioned developments, with the similar conditions to be included in the SLA:
 - i. Design, installation, etc. costs for the temporary solution will be the responsibility of the developer/developers and will not be deductible from the Augmentation Levee's
 - ii. The temporary solution is not a permanent solution and Augmentation Levee's for Water and Sewage will be used towards the permanent solution.
 - iii. The proposed pro-rata contribution towards the temporary solution must be resolved between the developers of the different properties.

3) Permanent water solution (refer figure 2)

- a. The permanent water solution entails the construction of a new 400mm/355mm watermain from the Bitou WTP to the Aventura Reservoir, with the costs estimated by GLS to be approximately R36m.
- b. The route, design, application and approval process for the pipeline will take approximately 18months.
- c. Bitou will liaise with their designated appointed consulting engineers to start the process as soon as possible.
- d. Augmentation Levees (*water and sewerage*) from each development will be used for the installation of a portion of the pipeline.
- e. A Service Level Agreement must be drafted for each development.
- f. Bitou's designated appointed consulting engineers will be responsible for professional services for phases 1-3 (*feasibility, approval and detail design*) of the pipeline and consulting engineers from each development will be responsible for phases 4-6 (*procurement, construction and close-out*)

- g. The Augmentation Levee's for each development (*and/or phase of the development*) will be re-calculated according to the specific year in which the levee's are paid.
- 4) Confirm capacity and connections with GLS
- a. Vita must set up a meeting with GLS to confirm the position and capacity of each development's connection into the bulk municipal network.
- 5) Possible off-grid solutions
- a. Bitou stated that they are willing to approve off-grid water and sewage solutions, on condition that specific requirements are met, with special conditions included in the SLA
 - i. The developer is responsible to obtain all the necessary environmental and regulatory approvals (*including GA or WULA*)
 - ii. All electrical equipment (*borehole, booster pumps, etc.*) must have a back-up electrical supply (*generator, inverter and battery pack or solar*)
 - iii. Potable water must adhere to SANS 241 Class 1 water parameters.
 - iv. Wastewater must be treated to Department of Water Affairs (DWA) General Limits parameters.
 - v. Water and treated effluent samples must be collected, analyzed by an independent laboratory and submitted to Bitou council on a monthly basis for the first year and quarterly basis for the second year.
 - vi. Should the water samples not adhere to the required standards, the developer/homeowners association will be liable for the costs to install the required potable water and foul sewer connections (*as proposed in the GLS capacity reports*).
 - vii. Augmentation levee's for potable water will not be applicable if the development adheres to the off grid requirements, but foul sewer levee's will still be applicable

I trust that you find the above a fair reflection of our meeting – I will forward the relevant documents (*appointments letters, draft Services Reports, proposed SLA wording, etc.*) as soon as possible.

Regards,

Riaan van Dyk *Pr. Eng*

Director

M 084 207 3223

E riaan@vitaeng.co.za

VITA CONSULTING
ENGINEERS

51 Lourensford Estate, Somerset West, 7130

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