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REVISED ENGINEERS REPORT FOR THE PROVISION OF CIVIL SERVICES TO THE PROPOSED BITOU CEMETERIES, PTN 33, FARM 437, PLETTENBERG BAY

1. INTRODUCTION AND BACKGROUND

This report was commissioned by Marike Vreken Urban & Environmental Planners, on behalf of the Bitou Municipality Bid No: SCM/STRAT 26/2013

The preliminary report has been based on the planning done for Bitou Cemeteries, Site development Plan, Preferred Layout dated September 2017. Bitou Municipality could require that GIs Consulting is appointed to do the bulk supply capacity analysis and make recommendations for possible infrastructure upgrades.

The developer would be required to enter into a Services Agreement with the Local Authority and negotiate payment of Capital and Augmentation levies.

2. SCOPE OF THE REPORT

- The services report deals with the bulk requirement and internal reticulation of water, sewage disposal and access to the property.
- Planning has been based on the proposed site layout received from Marike Vreken Urban & Environmental Planners dated September 2017.
 - Caretakers Dwelling 75m²
 - Chapel 150m²
 - Ablution 30m²

3. WATER SUPPLY AND STORAGE

(Refer to Report by GIs Consulting, Ebernezer Housing, dated May 2017)
The Sustained Peak Demand (SPD) of the development to be used to determine the capacity of trunk mains will be:

Caretakers Dwelling	@ 0,70m ³ /day	= 0.70
Chapel	@ 1.00m ³ /day	= 1,00
Standpipes	10 x @ 0,25m ³ /day	= 2,50
Ablution (6 toilets)	@ 1,80m ³ /day	= 1,80
SPD		= 6 m ³ /day

The Average Demand over Peak Month (DPM) to be used to determine the reservoir capacity will be:

Caretakers Dwelling	@ 0,60m ³ /day	= 0,60
Chapel	@0,80m ³ /day	= 0,80
Standpipes	10 x @ 0,250m ³ /day	= 2,50
Ablution (6 toilets)	@ 0,90m ³ /day	= 0,90
	DPM	= 4,8 m ³ /day

3.1 FIRE FLOW RATE FROM GUIDELINES

Residential

Low Risk Group 1	=	15 litres/sec
Duration of design fire flow	=	2 Hours

3.2 RESERVOIR STORAGE VOLUME REQUIRED

Total Storage	=	2 Days @ DPM + Fire Storage
	=	2 x 4,8 m ³ /day + 2 Hours @15 litres/sec
	=	9,6m ³ + 108m ³
	=	118m ³

3.3 DEVELOPMENTS WATER FLOW RATES

Bulk supply flow in 300mm pumping main from the Water Works to the New Horizons Reservoir is estimated to be:

$$= \frac{\text{DPM}}{\text{Pump Hours}} \times \frac{\text{Factor}}{1}$$

$$= \frac{4,8 \times 1000}{12 \times 3600} \times \frac{1,5}{1} = 0,2 \text{ litre/sec}$$

The instantaneous peak flow in the 200mm dia gravity main from New Horizons Reservoir to the development is estimated to be:

$$= \frac{\text{SPD}}{24 \times 3600} \times \frac{\text{Factor}}{1}$$

$$= \frac{6 \times 1000}{24 \times 3600} \times \frac{4,0}{1} = 0,3 \text{ litre/sec}$$

3.4 BULK WATER POINT OF SUPPLY

The point of supply could be the existing Kwanokuthula Tower Reservoir at elevation of 201m above MSL. The master planning includes the construction of a new 250mm dia gravity main from the Kwanokuthula Reservoir to the proposed Ebernezer Housing Development. The proposed Cemetery Development could then fall within the new Kwanokuthula / Ebernezer Water Supply Zone.

3.5 CAPITAL AND AUGMENTATION LEVIES

The provision of water could be accommodated in the future Ebenezer / Kwanokuthula Network.

- Reservoir Storage

Volume required for the Development is 118m³.

The existing 1,5MI, 1,5MI & 3,5MI Kwanokuthula reservoirs have sufficient reservoir storage volume to accommodate the proposed Cemetery.

- Transportation in Pumping Main & Supply Pipeline

Contribution to be finalized with the Municipality on a pro-rata basis of the water flow and the construction cost estimates.

The following master plan network upgrade items will be required;

- Kwanokuthula supply pipe network and new 250mm dia supply pipe including N2-crossing.
- Upgrade of the bulk supply system, interconnection of pipes & valves between supply pipes to New Horizons and Kwanokuthula, upgrade bulk supply pipe to 400mm dia and upgrade of pump station at Water Works.

An interim supply, before the network upgrades are completed could be a 200m³ new Tower Reservoir at the New Horizons Reservoir zone.

- Municipal Augmentation Levies

As this is a Bitou Municipal project the payment of Augmentation levies will not be required.

3.6 INTERNAL RETICULATION

Internal reticulation pipe diameter of 110mm diameter should be specified with a 32mm dia ring-main to standpipes and Dwelling / Chapel unit connections of 20mm diameter. The proposed cemetery located between contour level 175m & 150m MSL and should be provided with adequate residual water pressure from the Kwanokuthula Tower Reservoir at 201m above MSL.

4. SEWAGE DISPOSAL

(Refer to the Guidelines for Human Settlement Planning and Design)

- Average daily flow from Cemetery = 80% of SPD
- Peak factor for daily maximum flow = 2,5
- Extraneous Flow = 15%

4.1 DESIGN SEWAGE FLOW
Total Flow = $3,5\text{m}^3/\text{day} \times 80\%$

= $2,8\text{m}^3/\text{day}$

The peak wet weather flow which will gravitate to the proposed conservancy tank below the Chapel is as follows:

$2,8\text{m}^3/\text{day} \times 2,5 \text{ (PF)} \times 1,15 \times 1000/3600 \times 24 \text{ hours} = 0,10 \text{ litres/sec}$

4.2 EXTERNAL SEWAGE NETWORK

Sewage will gravitate from the internal network to the proposed new conservancy tank on the northern boundary of the Cemetery layout. Future planning could allow for the sewage to be pumped via a 110mm dia pumping main pipeline to the future Ebernezer Housing Development network where it would gravitate in the future bulk 250mm gravity outfall sewer to the Waste Water Treatment Works.

4.3 INTERNAL SEWAGE RETICULATION

Each Unit will be provided with an individual connection. The sewage will gravitate towards the proposed conservancy tank situated at contour level 150m. The conservancy tank should have a minimum capacity of 10 000 liters to reduce the trip generation of the sewage truck to once every two weeks. The internal network should consist of 160mm diameter pipes with manholes spaced at not more than 80m and at flow direction changes.

4.4 CAPITAL AND AUGMENTATION LEVIES

The sewage disposal could be accommodated in the future Ebernezer Housing Development outfall sewer to the Waste Water Treatment Works.

- Transportation cost from Cemetery to sewer works
Contribution to be finalized with the Municipality on a pro-rata basis of the sewage flow and future construction cost estimates.
- Municipal Augmentation Levies:
As this is a Bitou Municipal project the payment of Augmentation levies will not be required.

5. ROADS AND STORMWATER

5.1 ACCESS TO PROPOSED DEVELOPMENT

Access to the proposed Cemetery will be from the future Ebernezer Housing Development.
ITS Engineers have been appointed to investigate the proposed access layout and provide a traffic impact statement.

At this stage SANRAL could not provide any preliminary designs of the vertical alignment of the future N2 bypass and confirmed that as an interim the access over the road reserve can be a level crossing.

Once the N2 bypass is designed, SANRAL could require a road-over-road bridge and will possibly require a contribution from the Bitou Municipality for the construction of the bridge.

5.2 INTERNAL ROADS

The Municipal standard for a 20m road reserve is a 7,4m Blacktop, 2,5m parking lanes with 2,0m sidewalks (Class 4 Major Bus Route).

Once the traffic impact statement has been reviewed the Municipality could lower the standard to a 12m road reserve, 5,0m blacktop with 1,8m sidewalks. (Class 5a Access Street)

The layout of the internal road to the Chapel along the western boundary of the cemetery results in a steep gradient of up to 10%. This does not provide an easy access to the Chapel and parking area.

A building platform will have to be constructed for the Chapel, Crematorium & parking area due to the slope of the existing natural ground levels in the northern section of the Cemetery.

5.3 STORMWATER

The proposed Cemetery layout has been positioned on the level ridge with a natural water course along the eastern & western boundary.

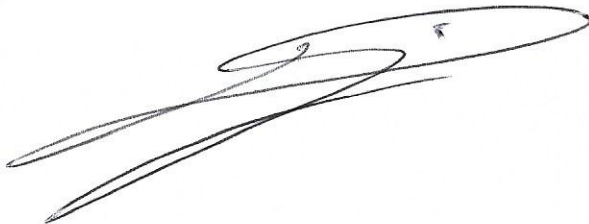
There should be no stormwater management required on the grave site areas.

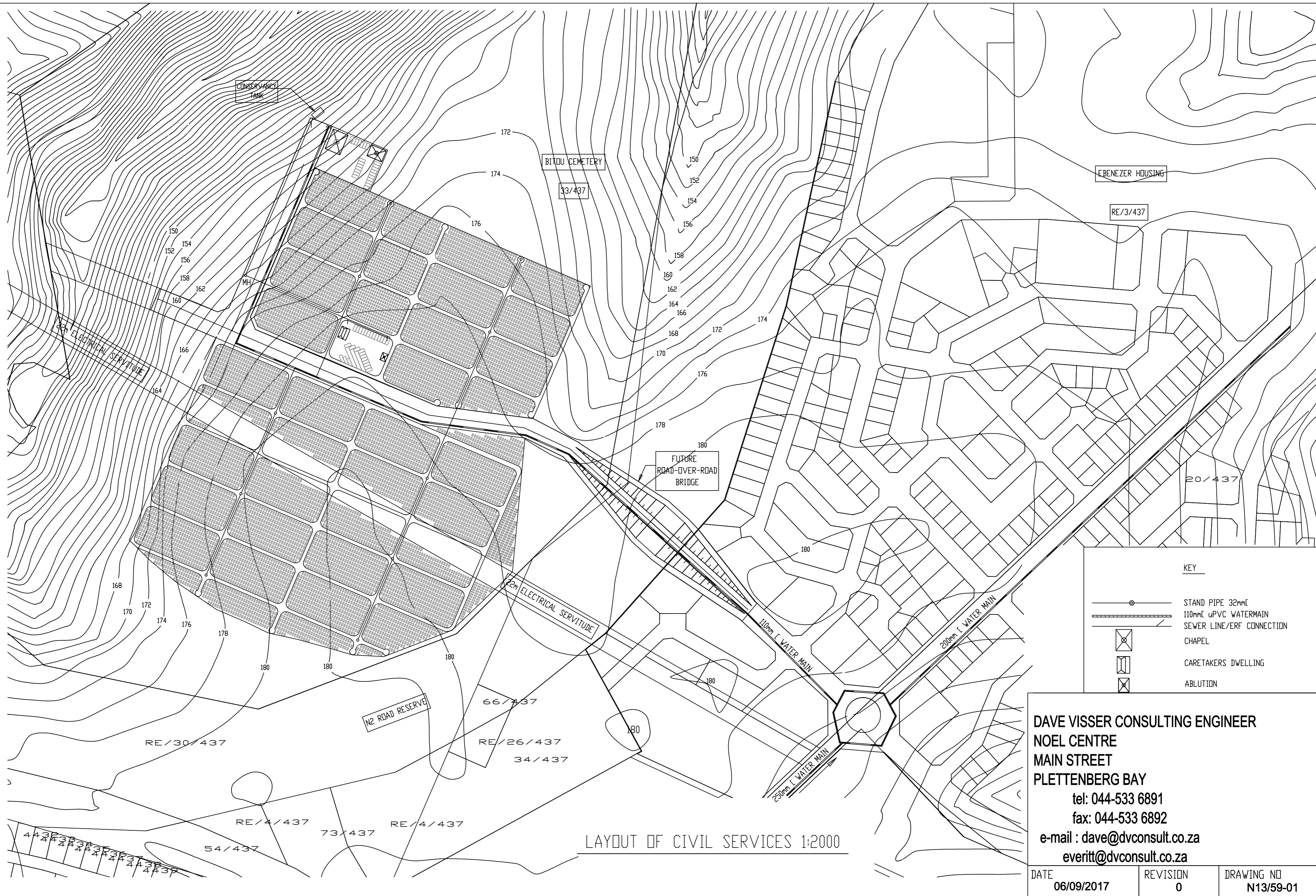
The concentration of stormwater runoff from the internal road to the Chapel and parking area along the western boundary will require stormwater management consisting of catchpits and outlet structures which should be designed to discharge into the existing water course with the provision of erosion protection measures.

6. CONCLUSION

In summary it can be concluded that Civil Services to the proposed Cemetery could be supplied by the Bitou Municipality.

D. J. Visser Pr Eng





KEY

	STAND PIPE 32mm
	110mm uPVC WATERMAIN
	SEWER LINE/ERF CONNECTION
	CHAPEL
	CARETAKERS DWELLING
	ABLUTION

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LAYOUT OF CIVIL SERVICES 1:2000

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