



**PROPOSED RESIDENTIAL DEVELOPMENT ON
ERF 23_20, VISVANGER STREET,
PATERNOSTER, WESTERN CAPE**

ENGINEERING SERVICES REPORT

Rev 0 2026.05.01

Rev 1 2026.06.08

SPECIALIST Stormwater Management SuDS Permeable Paving ■ **E:** peter@pwce.co.za **C:** 083 454 2143

CONSULTANT Civil Engineering Roads & Services ■ **A:** 10 Glebe Road, Rondebosch, Cape Town

INDEX

1. TERMS OF REFERENCE	- 1 -
2. INTRODUCTION.....	- 1 -
3. GENERAL DESCRIPTION OF THE SITE.....	- 1 -
4. GEOTECHNICAL INVESTIGATIONS	- 1 -
5. DEVELOPMENT LAYOUT.....	- 2 -
6. EARTHWORKS	- 3 -
7. ROAD CONSTRUCTION	- 3 -
8. STORMWATER STRATEGY AND PROPOSED RETICULATION.....	- 4 -
9. SEWERAGE.....	- 5 -
10. WATER SUPPLY	- 6 -
11. ELECTRICITY, TELKOM AND COMMUNICATIONS	- 6 -
12. CONCLUSIONS.....	- 6 -
13. REFERENCES.....	- 8 -
14. ANNEXURES.....	- 9 -

ANNEXURES

Annexure A: Drawings and Details

1. Locality Plan
2. 584-C-3 - Rev B – Erf 23_20 - Roads and Stormwater Layout
3. 584-C-4 - Rev B – Erf 23_20 – Water and Sanitation Layout
4. 584-C-5 - Rev B – Sections and Details

Annexure B: Calculations: WQV

Annexure C: Geotechnical Report (Available from PWCE on request) [Ref.13.9](#)

Annexure D: Transport Impact Assessment (Available from PWCE on request) [Ref.13.10](#)

Annexure E: Bulk Services Report

1. TERMS OF REFERENCE

Peter Wium Consulting Engineers was appointed by Candor Africa, to undertake a Civil Engineering and Stormwater Management assessment and to compile an Engineering Services Report on Erf 23_20, Visvanger Street, Paternoster. This report accompanies and informs the Land Use Management Application submission to the Local Authority.

2. INTRODUCTION

- 2.1 As part of the approval process for the proposed development of Erf 23_20, this Engineering Services Report indicates the roads and services that would be required to service the units in the proposed development.
- 2.2 The proposed private development comprises 33 units of size approximately 82m², configured as semi-detached single-story units.
- 2.3 There is controlled (sliding gate) access off Visvanger Street with an internal circular access road.
- 2.4 The design detail of servicing this development represents a workable, cost-effective solution within the constraints of the site location and the existing roads and services infrastructure.

3. GENERAL DESCRIPTION OF THE SITE

- 3.1 The site is situated in the small coastal town of Paternoster on the West Coast of the Western Cape, located within a kilometer from the sea.
- 3.2 The Local Authority is the Saldanha Bay Municipality located in Vredenburg.
- 3.3 The site is slightly trapezoidal in shape and is 0.8741 ha in extent.
- 3.4 The site is bounded by residential property to the north and open, undeveloped land on the other three sides. A 6m services servitude lies on the west boundary and the site is set back from Visvanger St by approximately 20m. Access is via an already constructed bellmouth into this set back entrance way, already named Oestervanger Street. There shall be a controlled but unmanned internal sliding gate at the end of the entrance way.
- 3.5 The site is fairly flat with undulating sand dunes (aeolian in origin) covered in sparse Strandveld vegetation. There is a slight fall across the site towards the north-west.

4. GEOTECHNICAL INVESTIGATIONS

- 4.1 A geotechnical investigation was carried out by GEOSS South Africa (Pty) Ltd in February 2026.
- 4.2 It is referred to in the references but is not attached to this report. [Ref. 13.9](#)

- 4.3 “The site is topographically flat, vegetated by Saldanha Flats Strandveld and characterized by surface deposits of loose sand.
- 4.4 The subsurface profile consists of three different soil horizons (1) an upper layer of transported material or uncontrolled fill (0.0 – 0.7mbgl) containing organic matter and rubble, (2) a medium dense transported sand layer exhibiting varying degrees of pedogenic cementation and (3) an underlying strongly cemented hardpan calcrete.
- 4.5 Consequently, the upper sands are classified as ‘soft excavation’, while the hardpan calcrete is classified as ‘hard excavation’ conditions per COLTO (2019) standards”.
- 4.6 From a civil perspective the site has varying conditions of density and suitability of materials for construction. These conditions shall need to be mitigated against at the time of construction, by soil improvement methods, to ensure a suitable standard and consistency of subgrade.
- 4.7 Permeability should be good (approximately 1×10^{-4} m/s) in the upper layers but a perched water table could occur in places.
- 4.8 There is a strong possibility of calcrete hardpan at fairly shallow depth which should be taken into account in specifications and costing for this site.
- 4.9 The water table was not encountered in any of the trial holes but generally will rise during the rainy winter months. Perched water table is possible on the discontinuous hardpan calcrete.

5. DEVELOPMENT LAYOUT

- 5.1 The central circular roadway, 6m wide, will give access to all units in the project. It will be paved and there will be off-street parking serving all units. These parking bays, however, will have a ‘grass-block’ type surface with stone chip infill, creating a permeable surface, a mitigating measure which is part of the stormwater management for the site.
- 5.2 The entrance to the site shall be via Oestervanger St directly onto Visvanger St, which is a circular residential collector. A new STOP sign and marking, on both Visvanger St and Oestervanger St, will be required. Refer to the Transport Impact Assessment (TIA) undertaken by ‘its Global’, [Ref 13.10](#), which informed the development proposal.
- 5.3 Water supply is available from mains reticulation in Visvanger St, while a sewer connection shall need an extension constructed to the main, also located in Visvanger St. [Refer to Sections 9 and 10 of this report.](#)
- 5.4 Stormwater run-off shall be dealt with on-site entirely. The site lends itself to an infiltration type stormwater management system, mimicking the current pre-development scenario where direct rainfall is able to percolate the sandy soils, re-charging the local aquifer. [Refer Section 8 of this report.](#)

- 5.5 Proposed stormwater management and control structures, and sewer and water reticulation required to service the development are shown on the PWCE drawings 584-C-3, -4 and -5 attached as [Annexure A](#).
- 5.6 Refuse shall be collected by the local authority via the internal road within the development.

6. EARTHWORKS

- 6.1 The earthworks levels will be informed by the stormwater and road systems proposed for the development.
- 6.2 Generally, the earthworks shall be designed to balance the quantities of cut and fill.
- 6.3 Densities of the in-situ material shall be checked over the whole road and fill areas prior to construction to inform the road design and generally inform future building structures.
- 6.4 There shall be no clay in the road layers within 600mm of the surface and any such clay shall be removed and replaced with granular material.
- 6.5 Calcrete, if located in reasonable quantities, can be used in the roadworks, ideally as one homogeneous layer.

7. ROAD CONSTRUCTION

- 7.1 Refer to PWCE drawing number 584-C-3, Stormwater and Roads Layout attached to this document as [Annexure A](#).
- 7.2 The proposed road network consists of using an existing bellmouth entrance off Visvanger Street and a 6m wide circular internal access road, with off-street parking at every unit.
- 7.3 Precast concrete mountable kerbs, and channels where appropriate, will line all the road edges. These kerbs will be replaced by in-situ concrete 'weirs' at points where stormwater will flow from the roadways to the central stormwater control structures made up of bio-retention ponds.
- 7.4 In higher order storms, when these ponds surcharge, overflows will run through the road system, through the entrance way, to the external road reserve.
- 7.5 The road system will have a paving surface to Architects details
- 7.6 The parking bays will all consist of a 'grassblock' type surface with stone chip infill.
- 7.7 All layers shall be specified to comply with the City of Cape Town 'Standards and Guidelines for Roads and Stormwater' (Version 4.0, Sept 2024) and supplemented by Saldanha Municipality Standard Specifications, SANS 1200⁷ and the 'Guidelines for Human Settlement Planning and Design, Volume 2; Department of Housing; CSIR Building and Construction Technology; (2005); (Red Book)⁴.

- 7.8 The internal roads shall be Private and managed and maintained by the Management Body or Home Owner Association.
- 7.9 The design of the Road layers will be carried out at Final Design Stage and will take into consideration traffic usage and class of road hierarchy. A preliminary section through the proposed road, is shown on the drawings.
- 7.10 Generally, the road layer works shall be designed for residential traffic, but allowance shall also be made for construction traffic.
- 7.11 There will be a 2.5% cross-fall on all roads and a minimum of 1% in the longitudinal direction towards the stormwater collection points.

8. STORMWATER STRATEGY AND PROPOSED RETICULATION

- 8.1 A preliminary layout of the Stormwater Management for the site, showing stormwater control structures, is shown on PWCE drawing 240-C-3 Roads and Stormwater Layout attached as [Annexure A](#).
- 8.2 Generally, the internal stormwater system will consist of bio-retention ponds located in central locations in landscaped areas. These will be the low point of the future site encouraging run-off to accumulate, attenuate and percolate downwards to the local aquifer.
- 8.3 Although there is existing external infrastructure in fairly close proximity, to which the stormwater run-off could outfall, a **Stormwater Management Strategy** of infiltration was adopted to mimic the existing pre-development scenario.
- 8.4 The concentrated flows can be collected in the series of pond structures, limiting surface flows off-site to only the larger recurrence interval storms (above the 50-year Average Recurrence Interval (ARI) storm scenarios).
- 8.5 This is the natural scenario currently, where virtually no storm flow from the site reaches the adjacent developed residential areas. All rainfall infiltrates into the permeable sands.
- 8.6 The development is on a 'Greenfields' site which is greater than 4000m² in size and as such is subject to the requirements of the City of Cape Town; 'Management of Urban Stormwater Impacts Policy'; (2009). The site would therefore be required to attenuate and treat Stormwater runoff at source on the site, prior to discharging into the downstream watercourses.
- 8.7 In order to **treat** the run-off to an acceptable standard and to meet the City's Policy objectives, the control structures or Best Management Practice (BMP) option for stormwater runoff control, shall be sized to contain the **Water Quality Volume (WQV)** (City of Cape Town; 'Management of Urban Stormwater Impact Policy'; (2009)⁵ .
- 8.8 The bio-retention ponds shown on the site layout, will be sufficient to contain the WQV required.
- 8.9 The actual required WQV for this site is 99.91m³, with the total accumulated size of ponds to be constructed at 350mm deep, 133m³. Refer Calculations in [Annexure B](#).

- 8.10 These calculations shall be confirmed as part of the Stormwater Management Plan at Final Design Stage using the Micro Drainage Computer Program to model the series of ponds. However, preliminary calculations do show that there is sufficient volume available to satisfy the WQV requirement.
- 8.11 With regard to **attenuation**, the high permeability of the in-situ sands (estimated at 1×10^{-4} m/s) and the ability to vary the pond size slightly at a later stage, confirms that the requirements for attenuation can also be met.
- 8.12 The City of Cape Town Stormwater Policy Objectives therefore will be met.
- 8.13 Overland escape for flows in excess of the 50yr ARI storm, will be via the entrance into the external road network.
- 8.14 All Stormwater shall be specified to comply with the City of Cape Town 'Standards and Guidelines for Roads and Stormwater' (Version 4.0, Sept 2024) and supplemented by Saldanha Municipality Standard Specifications, SANS 1200⁷ and the 'Guidelines for Human Settlement Planning and Design, Volume 2; Department of Housing; CSIR Building and Construction Technology; (2005); (Red Book)⁴.

9. SEWERAGE

- 9.1 The existing and proposed foul sewer reticulation is shown on PWCE drawing 584-C-4 Water and Sanitation Layout attached as [Annexure A](#).
- 9.2 There is an existing sewer line in Visvanger St to which the site can connect. However, a section, approximately 30m long, of public sewer will have to be constructed within the road reserve. as shown.
- 9.3 Although there is a possibility of future upgrades to the external reticulation, there is sufficient immediate capacity in the external reticulation to service this site. Refer Bulk Services Report by GLS Consulting Engineers attached as [Annexure E](#).
- 9.4 All foul sewer reticulation will be via gravity flow.
- 9.5 All foul sewer reticulation shall be specified to comply with the City of Cape Town 'Standards and Guidelines for Roads and Stormwater' (Version 4.0, Sept 2024) and supplemented by Saldanha Municipality Standard Specifications, SANS 1200⁷ and the 'Guidelines for Human Settlement Planning and Design, Volume 2; Department of Housing; CSIR Building and Construction Technology; (2005); (Red Book)⁴.
- 9.6 All main lines shall be 160mm diameter Heavy Duty uPVC pipe to SABS 791/1985. Unit connections shall be 110mm diameter HD uPVC also to SABS 791/1985.
- 9.7 All manholes shall be 1050mm diameter and be constructed in accordance with the City of Cape Town Standard as per 9.5 above.
- 9.8 Minimum cover to pipes shall be 1000mm.
- 9.9 Minimum velocities in pipe runs shall be 0.7m/s when flowing full.

10. WATER SUPPLY

- 10.1 The water reticulation proposed for the site is shown on PWCE drawing 584-C-4 Water and Sanitation Layout attached as [Annexure A](#).
- 10.2 There is an existing external water reticulation network adjacent to the site in Visvanger Street which has adequate capacity to serve the demand anticipated from the development, and a bulk water meter, to Local Authority Standards, will be constructed at the entrance, to serve the site.
- 10.3 There will be sufficient water supply and pressure for the site from the adjacent reticulation. Some upgrades to the external reticulation will be required. Refer Bulk Services Report by GLS attached as [Annexure E](#).
- 10.4 The entire internal water reticulation will be installed by the Developer and maintenance shall be the responsibility of the Management Body or Home Owner Association.
- 10.5 The entire water reticulation, including Fire Hydrants and Bulk Meter shall be specified to comply with the City of Cape Town 'Standards and Guidelines for Roads and Stormwater' (Version 4.0, Sept 2024) and supplemented by Saldanha Municipality Standard Specifications, SANS 1200⁷ and the 'Guidelines for Human Settlement Planning and Design, Volume 2; Department of Housing; CSIR Building and Construction Technology; (2005); (Red Book)⁴.
- 10.6 Each unit shall have a 28mm diameter OD connection and be fitted with a stop valve.
- 10.7 All main lines shall be uPVC Class 12 pressure pipe to SABS 966-1976. All unit connections shall be Class 16 HDPE pressure pipe to SABS 533.

11. ELECTRICITY, TELKOM AND COMMUNICATIONS

- 11.1 It would appear that there is sufficient capacity in the surrounding Electricity and Telkom/Fibre Network reticulation to service the site.
- 11.2 Negotiations with these suppliers shall commence at final design stage.
- 11.3 Sufficient ducts and drawboxes shall be laid internally to cater for all reticulation and road crossings.
- 11.4 Communication ducts and possibly Fibre-optic ducts, as required, shall also be laid internally to cater for any future reticulation design.

12. CONCLUSIONS

- 12.1 From preliminary investigations of the site and taking into account the topography and good compactability of the in-situ sands, as well as its good permeability, the development of this erf can be easily and cost effectively undertaken.

- 12.2 The stormwater management on site, using bio-retention ponds as the control structures, is also appropriate and very cost effective. The Stormwater Management Objectives, as set out in the City of Cape Town Policy, adapted for use here, can be easily achieved, making it the perfect solution to Stormwater Management on this site.
- 12.3 Generally, the Roads and Services for this site can be economically and adequately installed without un-due or un-planned impact on the surrounding infrastructure.
- 12.4 From a Civil Design perspective, therefore, this solution for the Engineering Services is practical and manageable, as well as being appropriate for the site and the area.
- 12.5 All design of the Engineering aspects of the project shall be carried out in close liaison with the Local Authority and would take into account agreements and conditions already established in participation with adjacent owners, environmental bodies and other interested parties.

PETER WIUM CONSULTING ENGINEER



PM WIUM Pr.Eng.

Cell: 083 454 2143

Date: 8.06.2026



13. REFERENCES

- 13.1 City of Cape Town: 'Standards and Guidelines for Roads and Stormwater; Version 4.0'; (Sept 2024)
- 13.2 City of Cape Town: Water and Sanitation Department: 'Service Guidelines and Standards, Version 3.2'; (28 May 2015)
- 13.3 Structural Design of Interurban and Rural Road Pavements (TRH 4); (1985).
- 13.4 Guidelines for Human Settlement Planning and Design, Volume 2; Department of Housing; CSIR Building and Construction Technology; (2005); (Red Book) and the Guidelines for the Provision of Engineering Services for Residential Townships; Department of Community Development; (1983); (Blue Book)
- 13.5 City of Cape Town: Roads and Stormwater Department: Catchment, Stormwater and River Management Branch; Management of Urban Stormwater Impacts Policy; (May 2009)
- 13.6 City of Cape Town: Stormwater Management Planning and Design Guidelines for New Developments; (2002).
- 13.7 SANS 1200: Standard Specifications for Civil Engineering Construction.
- 13.8 SANS 10400-W: (2011), Edition 3; Fire Installation
- 13.9 Geotechnical Investigation for Portion 20 of Farm 23, Paternoster, Western Cape; (17 March 2026); GEOSS, Report No. 2026/03-12
- 13.10 Transport Impact Assessment (TIA), Portions 17-and 20 of Farm 23, Paternoster, Western Cape; Innovative Transport Solutions (ITS); Revision 1, April 2026.

14. ANNEXURES

(See separate documents attached)

Annexure A: Drawings and Details

1. Locality Plan
2. 584-C-3 – Rev B – Roads and Stormwater Layout
3. 240-C-4 – Rev B – Water and Sanitation Layout
4. 240-C-5 – Rev B – Sections and Details

Annexure B: Calculations: WQV

Annexure C: Geotechnical Report

Annexure D: Transport Impact Assessment

Annexure E: Bulk Services Report

14.1 ANNEXURE A: DRAWINGS AND DETAILS

Locality Plan

584-C-3 – Rev B – Roads and Stormwater Layout

240-C-4 – Rev B – Water and Sanitation Layout

240-C-5 – Rev B – Sections and Details

Erf 23_20, Visvanger St, Paternoster



Map Center: Lon: 17°53'50.5"E
Lat: 32°48'34.7"S

Scale: 1:4,514
Date created: 2026/05/21



Western Cape
Government
FOR YOU

Source: Esri, Vantor, Earthstar Geographics, and the GIS User Community
Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community



NOTES

GENERAL

- ALL WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH THESE NOTES, THE LOCAL AUTHORITY GUIDELINES, THE SABS 1200 STANDARDIZED SPECIFICATION AS WELL AS THE PROJECT SPECIFICATION
- THIS DRAWING TO BE READ TOGETHER WITH ALL RELEVANT ARCHITECT'S AND/OR ENGINEER'S DRAWINGS AND SPECIFICATIONS
- ALL DETAILS AND DIMENSIONS SHOWN ON THIS DRAWING ARE SUBJECT TO CONFIRMATION ON SITE
- CONTRACTOR SHALL EXPOSE AND VERIFY LEVELS OF ALL EXISTING SERVICES WHICH MUST BE CONNECTED TO, PRIOR TO ANY WORK BEING DONE
- ALL CONSTRUCTION WORK TO, OR ADJACENT TO EXISTING SERVICES, TO BE CARRIED OUT IN STRICT ACCORDANCE WITH THE REQUIREMENTS OF THE RELEVANT AUTHORITIES
- WHERE APPLICABLE, ALL WORK IN PUBLIC RESERVES SHALL BE CARRIED OUT IN ACCORDANCE WITH THE CITY OF CAPE TOWN'S STANDARDS AND GUIDELINES FOR ROADS AND STORMWATER DESIGN, VERSION 4, SEPTEMBER 2024
- WHERE CARRIAGEWAY CROSSINGS ARE INVOLVED, IT WILL BE IN ACCORDANCE WITH THE CITY OF CAPE TOWN'S GUIDELINES FOR THE PROVISION OF CARRIAGEWAY CROSSINGS (REV 2.1, OCTOBER 2024) ANNEXURE B
- CONTRACTOR SHALL OBTAIN ALL NECESSARY APPROVALS IN THE FORM OF WAYLEAVES AND PERMITS NEEDED TO CONNECT TO EXISTING MUNICIPAL SERVICES OR TO DO ANY WORK ON PUBLIC/MUNICIPAL PROPERTY

STORMWATER

- ALL WORKS TO COMPLY WITH CITY OF CAPE TOWN ROADS AND STORMWATER STANDARDS AND GUIDELINES FOR ROADS & STORMWATER (SEP 2024-VER 4) AND APPLICABLE SABS 1200 SPECIFICATIONS
- EXTRA CARE MUST BE TAKEN IN THE SWALE AREAS TO PREVENT DAMAGE TO EXISTING MUNICIPAL SERVICES
- ALL PLANTING IN SWALES TO BE IN ACCORDANCE WITH CITY OF CAPE TOWN SUDS LANDSCAPE AND INDIGENOUS SPECIES GUIDE (FEB 2001 VER 1.0)

EARTHWORKS, ROADS AND SURFACING

- ALL WORKS TO COMPLY WITH CITY OF CAPE TOWN ROADS AND STORMWATER STANDARDS AND GUIDELINES FOR ROADS & STORMWATER (SEP 2024-VER 4) AND APPLICABLE SABS 1200 SPECIFICATIONS
- ANY MATERIAL FROM SITE USED FOR FILLING TO BE APPROVED BY THE ENGINEER
- EXCESS MATERIAL TO BE SPOILED TO AN APPROVED SITE LOCATED BY THE CONTRACTOR
- MINIMUM NUMBER OF DENSITY TESTS REQUIRED FOR IN SITU AND IMPORTED LAYERS TO BE 4 DENSITY TESTS / 1000M² / LAYER OF UP TO 300MM. COSTS OF THESE PROCESS CONTROL TESTS SHALL BE INCLUDED IN THE RATES SUBMITTED FOR THE LAYERWORK
- PARKING LINES WILL BE 100MM WIDE AND DONE IN WHITE REFLECTORIZED PAINT (UNLESS OTHERWISE SPECIFIED) SUITABLE FOR APPLICATION TO CONCRETE SURFACE AND AS PER STANDARD APPLICATION SPECIFICATIONS
- CONCRETE PAVERS TO COMPLY WITH THE STANDARD SPECIFICATIONS FOR CONCRETE PAVING BLOCKS (SANS 1058:2021 EDITION 2.2)
- PAVERS ARE TO BE OF CLASS 4/2/6 AS PER THE STANDARD SPECIFICATIONS AND BE TESTED ACCORDING TO THE METHODS SPECIFIED IN THE STANDARD SPECIFICATIONS. RESULTS TO BE SUBMITTED TO PWCE FOR APPROVAL

SCALE - 1:250

FOR PWCE:

P.M. WIUM

PR.ENG. No. 890018

C	25-05-2026	DRAWING IMPROVEMENTS
B	06-05-2026	SITE DEVELOPMENT PLAN ISSUE
A	17-03-2026	PRELIMINARY ISSUE

REF	DATE	DESCRIPTION
-----	------	-------------

THE DETAILS AND DESIGN SHOWN ON THIS DRAWING ARE COPYRIGHT AND REMAIN THE PROPERTY OF PETER WIUM CONSULTING ENGINEER.

peterwium
CONSULTING
ENGINEER

- SPECIALIST Sustainable Stormwater Systems
- CONSULTANT Aquaflo® Permeable Paving
- 10 Giebel Road, Rondebosch, Cape Town
- T/C 083 454 2143 peter@pwce.co.za

Project

VAALPLAAS DEVELOPMENT
ERF 23/20 PATERNOSTER

Section

ROADS & STORMWATER
LAYOUT

Date	Designed	Drawn & Rev
17-03-2026	P.M.W.	584-C-3
Drawn	Checked	
S.H.	P.M.W.	A/B/C



NOTES

- GENERAL
- ALL WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH THESE NOTES, THE LOCAL AUTHORITY GUIDELINES, THE SABS 1200 STANDARDIZED SPECIFICATION AS WELL AS THE PROJECT SPECIFICATION
 - THIS DRAWING TO BE READ TOGETHER WITH ALL RELEVANT ARCHITECT'S AND/OR ENGINEER'S DRAWINGS AND SPECIFICATIONS
 - ALL DETAILS AND DIMENSIONS SHOWN ON THIS DRAWING ARE SUBJECT TO CONFIRMATION ON SITE
 - CONTRACTOR SHALL EXPOSE AND VERIFY LEVELS OF ALL EXISTING SERVICES WHICH MUST BE CONNECTED TO, PRIOR TO ANY WORK BEING DONE
 - ALL CONSTRUCTION WORK TO, OR ADJACENT TO EXISTING SERVICES, TS TO BE CARRIED OUT IN STRICT ACCORDANCE WITH THE REQUIREMENTS OF THE RELEVANT AUTHORITIES
 - WHERE APPLICABLE, ALL WORK IN PUBLIC RESERVES SHALL BE CARRIED OUT IN ACCORDANCE WITH THE CITY OF CAPE TOWN'S STANDARDS AND GUIDELINES FOR ROADS AND STORMWATER DESIGN, VERSION 3, FEBRUARY 2022
 - WHERE CARRIAGEWAY CROSSINGS ARE INVOLVED, IT WILL BE IN ACCORDANCE WITH THE CITY OF CAPE TOWN'S GUIDELINES FOR THE PROVISION OF CARRIAGEWAY CROSSINGS (REV 2.0) ANNEXURE B
 - CONTRACTOR SHALL OBTAIN ALL NECESSARY APPROVALS IN THE FORM OF WAYLEAVES AND PERMITS NEEDED TO CONNECT TO EXISTING MUNICIPAL SERVICES OR TO DO ANY WORK ON PUBLIC/MUNICIPAL PROPERTY

- WATER
- ALL WORKS TO COMPLY WITH CITY OF CAPE TOWN WATER AND SANITATION DEPARTMENT "SERVICE GUIDELINES AND STANDARDS (2019 VER 3.3)" AND APPLICABLE SABS 1200 SPECIFICATIONS
 - UPVC PIPES TO BE LAID IN A FLEXIBLE BEDDING AS PER SABS 1200 LBC
 - CONNECTION TO EXISTING MUNICIPAL WATER MAIN TO BE IN STRICT ACCORDANCE WITH CITY OF CAPE TOWN STANDARDS AND SPECIFICATIONS
 - DOMESTIC WATER MAINS TO BE HDPE TO SANS ISO 4427 PE100 PN 12.5 USING APPROVED COMPRESSION COUPLINGS
 - ALL CONNECTION ENDS TO BUILDING TO HAVE ENDCAPS AND BE MARKED WITH 1200MM LONG STAKE. BOTTOM OF STAKE TO BE AT IL OF PIPE
 - DEPTH OF COVER OVER WATER MAINS MIN. 1000MM
 - ALL PIPEWORK TO BE PRESSURE TESTED ACCORDING TO SANS1200L TO 1.25 TIMES CLASS OF PIPE. TESTING TO BE WITNESSED AND APPROVED BY THE ENGINEER
 - THE CONTRACTOR SHALL ARRANGE ALL FINAL INSPECTIONS WITH RELEVANT DEPARTMENTS AT THE LOCAL AUTHORITY AND OBTAIN CLEARANCE CERTIFICATES WHERE NEEDED
 - FIRE AND SPRINKLER RETICULATION MAINS TO BE CLASS 16 UPVC TO SABS 966 PT 1
 - FIRE HYDRANTS TO BE OF THE UNDERGROUND TYPE AS PER DETAIL

- SEWER
- ALL WORKS TO COMPLY WITH CITY OF CAPE TOWN WATER AND SANITATION DEPARTMENT "SERVICE GUIDELINES AND STANDARDS (2019 VER 3.3)" AND APPLICABLE SABS 1200 SPECIFICATIONS
 - SEWER MANHOLES INSIDE THE DEVELOPMENT SHALL BE PRECAST CONCRETE RING TYPE MANHOLES WITH COVERSLAB OF 150MM MINIMUM THICKNESS AND DUCTILE IRON TYPE 2A RINGED COVER AND FRAME. MANHOLE OPENING AND STEP IRONS TO BE LOCATED AS CLOSE AS POSSIBLE TO THE CENTRE OF THE MAIN OUTGOING PIPELINE
 - ALL JOINTS TO BE SEALED WITH AN APPROVED JOINT SEALANT
 - IN ALL RESPECTS, OTHER THAN THOSE SPECIFICATIONS DETAILED ON THIS DRAWING, MANHOLES TO CONFORM WITH SANS 1294 AS AMENDED
 - SEWER MAINS TO BE 160MM DIA CLASS 34 UPVC
 - ALL SEWER CONNECTIONS TO BE 110MM DIA CLASS 34 UPVC LAID AT 1:60 GRADIENT
 - ALL CONNECTION POINTS TO BUILDINGS TO HAVE ENDCAPS AND BE MARKED WITH 1200MM LONG STAKE. BOTTOM OF STAKE TO BE AT IL OF PIPE
 - PIPES TO BE LAID IN A FLEXIBLE BEDDING AS PER SABS 1200 LB
 - PIPES SHALL BE AIR AND MIRROR TESTED AS PER SABS REQUIREMENTS

SCALE - 1:250

FOR PWCE:  P.M. WIUM PR.ENG. No. 890018

C	25-05-2026	DRAWING IMPROVEMENTS
B	06-05-2026	SITE DEVELOPMENT PLAN ISSUE
A	17-03-2026	PRELIMINARY ISSUE
REF	DATE	DESCRIPTION
THE DETAILS AND DESIGN SHOWN ON THIS DRAWING ARE COPYRIGHT AND REMAIN THE PROPERTY OF PETER WIUM CONSULTING ENGINEER		

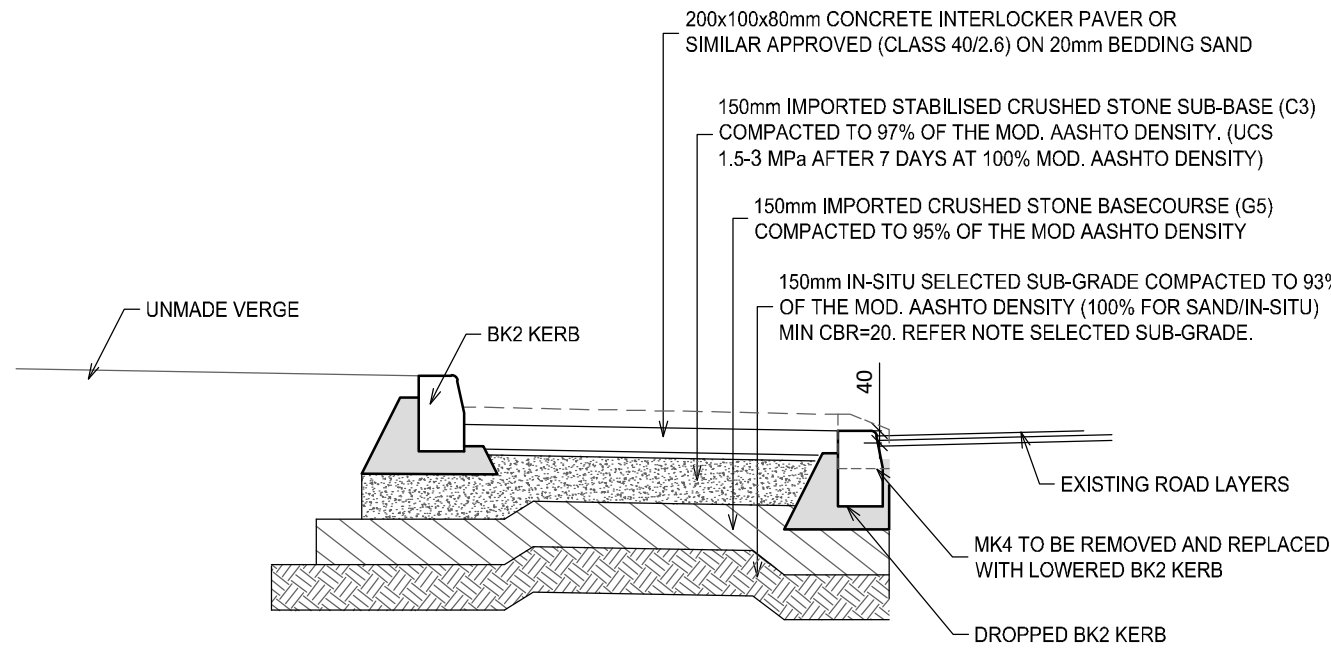
peterwium
CONSULTING ENGINEER

- SPECIALIST Sustainable Stormwater Systems
- CONSULTANT Aquatflow® Permeable Paving
- 10 Giebel Road, Rondebosch, Cape Town
- T/C 083 454 2143 peter@pwce.co.za

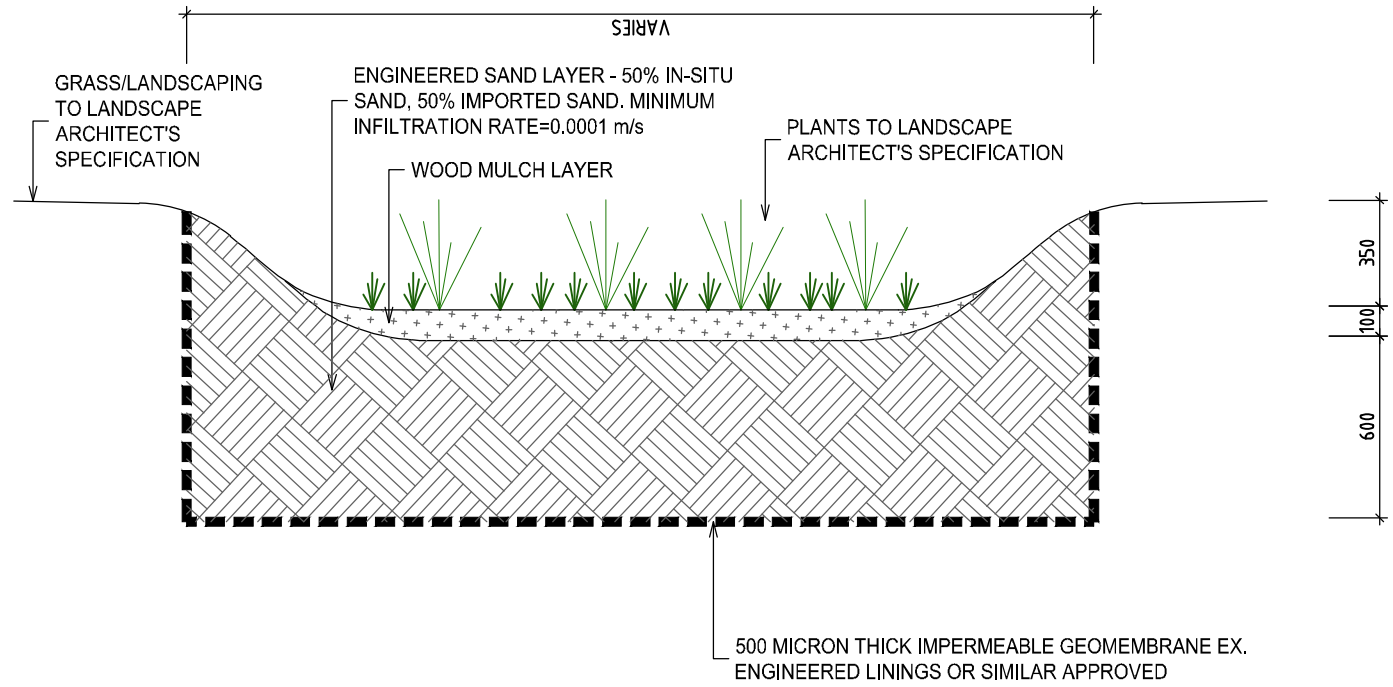
Project VAALPLAAS DEVELOPMENT ERF 23/20 PATERNOSTER		
Section WATER & SANITATION LAYOUT		
Date 17-03-2026	Designed P.M.W.	Drawn & Rev 584-C-4
Drawn S.H.	Checked P.M.W.	A/B/C

LEGEND

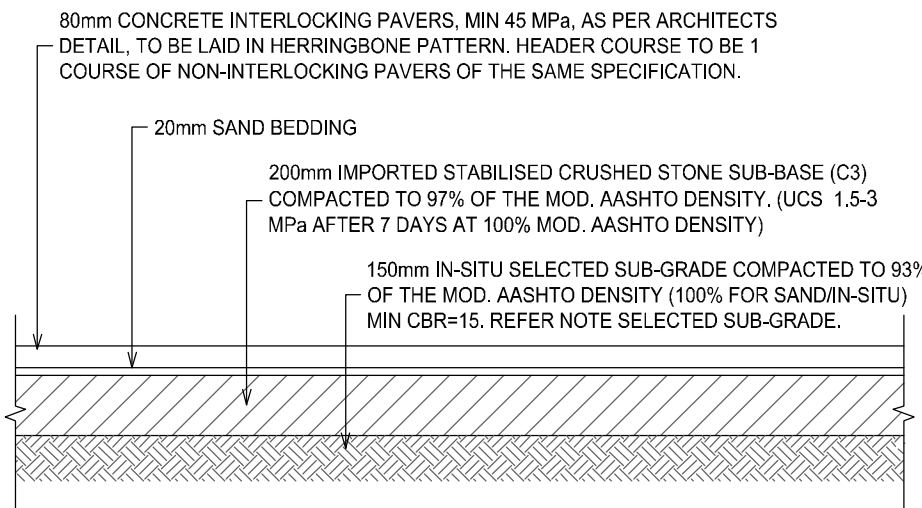
- EXISTING WATER MAIN
- PROPOSED 110mmØ uPVC CLASS 12 WATERMAIN
- PROPOSED 20mmØ HDPE CLASS 16 WATER PIPE
- EXISTING SEWER MAIN
- PROPOSED 160mmØ uPVC CLASS 34 FOUL SEWER
- PROPOSED 110mmØ uPVC CLASS 34 SEWER CONNECTION
- WATER VALVE
- FIRE HYDRANT
- FOULS SEWER MANHOLE



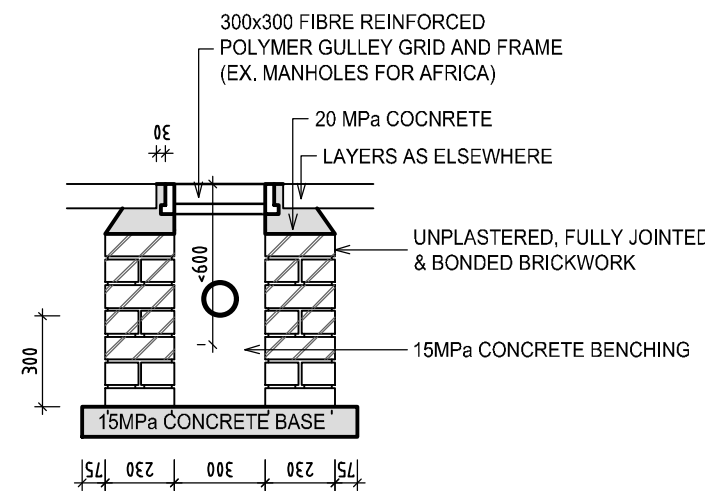
1:25 SECTION THROUGH REFUSE EMBAYMENT



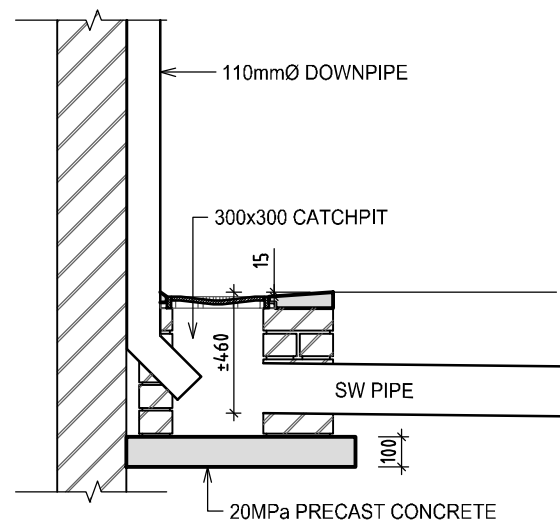
1:25 TYPICAL SECTION THROUGH
BIO-RETENTION AREA



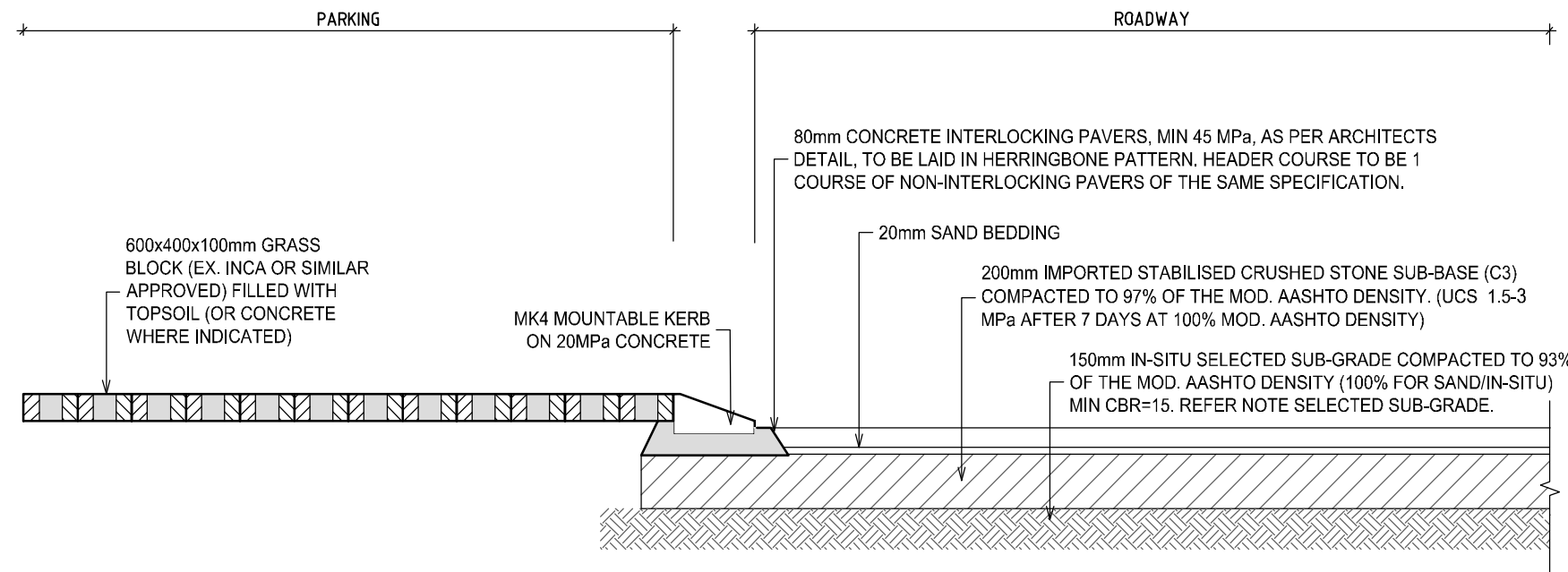
1:25 TYPICAL SECTION THROUGH TRADITIONAL
BLOCK PAVING PAVEMENT STRUCTURE TO
INTERNAL TRAVELED WAYS AND CWC'S



1:25 DETAIL THROUGH 300x300
CATCHPIT WITH SILT TRAP



1:25 DETAIL THROUGH
300x300 CATCHPIT



1:25 TYPICAL SECTION THROUGH ROADWAY AND
GRASS BLOCK PARKING

NOTES

GENERAL

- ALL WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH THESE NOTES, THE LOCAL AUTHORITY GUIDELINES, THE SABS 1200 STANDARDIZED SPECIFICATION AS WELL AS THE PROJECT SPECIFICATION
- THIS DRAWING TO BE READ TOGETHER WITH ALL RELEVANT ARCHITECT'S AND/OR ENGINEER'S DRAWINGS AND SPECIFICATIONS
- ALL DETAILS AND DIMENSIONS SHOWN ON THIS DRAWING ARE SUBJECT TO CONFIRMATION ON SITE
- CONTRACTOR SHALL EXPOSE AND VERIFY LEVELS OF ALL EXISTING SERVICES WHICH MUST BE CONNECTED TO, PRIOR TO ANY WORK BEING DONE
- ALL CONSTRUCTION WORK TO, OR ADJACENT TO EXISTING SERVICES, TO BE CARRIED OUT IN STRICT ACCORDANCE WITH THE REQUIREMENTS OF THE RELEVANT AUTHORITIES
- WHERE APPLICABLE, ALL WORK IN PUBLIC RESERVES SHALL BE CARRIED OUT IN ACCORDANCE WITH THE CITY OF CAPE TOWN'S STANDARDS AND GUIDELINES FOR ROADS AND STORMWATER DESIGN, VERSION 4, SEPTEMBER 2024
- WHERE CARRIAGEWAY CROSSINGS ARE INVOLVED, IT WILL BE IN ACCORDANCE WITH THE CITY OF CAPE TOWN'S GUIDELINES FOR THE PROVISION OF CARRIAGEWAY CROSSINGS (REV 2.1, OCTOBER 2024) ANNEXURE B
- CONTRACTOR SHALL OBTAIN ALL NECESSARY APPROVALS IN THE FORM OF WAYLEAVES AND PERMITS NEEDED TO CONNECT TO EXISTING MUNICIPAL SERVICES OR TO DO ANY WORK ON PUBLIC/MUNICIPAL PROPERTY

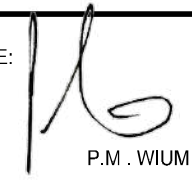
STORMWATER

- ALL WORKS TO COMPLY WITH CITY OF CAPE TOWN ROADS AND STORMWATER STANDARDS AND GUIDELINES FOR ROADS & STORMWATER (SEP 2024 VER 4) AND APPLICABLE SABS 1200 SPECIFICATIONS
- EXTRA CARE MUST BE TAKEN IN THE SWALE AREAS TO PREVENT DAMAGE TO EXISTING MUNICIPAL SERVICES
- ALL PLANTING IN SWALES TO BE IN ACCORDANCE WITH CITY OF CAPE TOWN SUDS LANDSCAPE AND INDIGENOUS SPECIES GUIDE (FEB 2001 VER 1.0)

EARTHWORKS, ROADS AND SURFACING

- ALL WORKS TO COMPLY WITH CITY OF CAPE TOWN ROADS AND STORMWATER STANDARDS AND GUIDELINES FOR ROADS & STORMWATER (SEP 2024 VER 4) AND APPLICABLE SABS 1200 SPECIFICATIONS
- ANY MATERIAL FROM SITE USED FOR FILLING TO BE APPROVED BY THE ENGINEER
- EXCESS MATERIAL TO BE SPOILED TO AN APPROVED SITE LOCATED BY THE CONTRACTOR
- MINIMUM NUMBER OF DENSITY TESTS REQUIRED FOR IN SITU AND IMPORTED LAYERS TO BE 4 DENSITY TESTS / 1000M² / LAYER OF UP TO 300MM. COSTS OF THESE PROCESS CONTROL TESTS SHALL BE INCLUDED IN THE RATES SUBMITTED FOR THE LAYERWORK
- PARKING LINES WILL BE 100MM WIDE AND DONE IN WHITE REFLECTORIZED PAINT (UNLESS OTHERWISE SPECIFIED) SUITABLE FOR APPLICATION TO CONCRETE SURFACE AND AS PER STANDARD APPLICATION SPECIFICATIONS
- CONCRETE PAVERS TO COMPLY WITH THE STANDARD SPECIFICATIONS FOR CONCRETE PAVING BLOCKS (SABS 1058:2021 EDITION 2.2)
- PAVERS ARE TO BE OF CLASS 4/2/6 AS PER THE STANDARD SPECIFICATIONS AND BE TESTED ACCORDING TO THE METHODS SPECIFIED IN THE STANDARD SPECIFICATIONS. RESULTS TO BE SUBMITTED TO PWCE FOR APPROVAL

SCALE - AS SHOWN

FOR PWCE: 
P.M. WIUM PRE.ENG. No. 890018

REF	DATE	DESCRIPTION
A	17-03-2026	PRELIMINARY ISSUE.
REF	DATE	DESCRIPTION
THE DETAILS AND DESIGN SHOWN ON THIS DRAWING ARE COPYRIGHT AND REMAIN THE PROPERTY OF PETER WIUM CONSULTING ENGINEER.		

peterwium
CONSULTING
ENGINEER

- SPECIALIST Sustainable Stormwater Systems
- CONSULTANT Aquatlow® Permeable Paving
- 10 Giebel Road, Rondebosch, Cape Town
- T/C 083 454 2143 peter@pwce.co.za

Project VAALPLAAS DEVELOPMENT ERF 23/20 PATERNOSTER		
Section SECTIONS AND DETAILS		
Date 17-03-2026	Designed P.M.W.	DrwgNo & Rev 584-C-5
Drawn S.H.	Checked P.M.W.	

14.2 ANNEXURE B: CALCULATIONS

584 - Erf 23_20, Visvanger St, Paternoster

ANNEXURE: B

WQv CALCULATION	
	ERF 23-20
PROJECT AREA (m ²)	8741
HARDENED SURFACE (m ²)	5682
% COVERAGE (I)	65.00
VOLUMETRIC RUNOFF COEFFICIENT $R_v = 0.05 + 0.009(I)$	0.64
1/2 yr 24hr STORM (mm/hr)	0.75
24hr PRECIPITATION DEPTH (mm)	18
REQUIRED WQv (m³)	99.91

STRUCTURE	TOP AREA	AV. DEPTH	STORAGE (m³)
Bio-retention Ponds	380	0.35	133.00
STORAGE PROVIDED			133.00

14.3 ANNEXURE C: GEOTECHNICAL REPORT

**(Removed from this report due to duplication with main application.
Referred to in document only, but available from PWCE is required.)**

14.4 ANNEXURE D: TRANSPORT IMPACT ASSESSMENT

**(Removed from this report due to duplication with main application.
Referred to in document only, but available from PWCE is required.)**

14.5 ANNEXURE E: BULK SERVICES REPORT

5 February 2026

Vaalplaas DevCo
66 Kompas Street
Paternoster
7381

Attention: Mr Louren du Plooy

Dear Sir,

**PROPOSED RESIDENTIAL DEVELOPMENT ON PORTIONS 17 & 20 OF FARM 23, PATERNOSTER:
CAPACITY ANALYSIS OF THE BULK WATER & SEWER SERVICES**

Your request regarding comments on the bulk water and sewer supply for the proposed development of a hotel on portion 17 of Farm 23 and a residential development portion 20 of Farm 23, located in Paternoster, refers.

This document should inter alia be read in conjunction with the Water Master Plan (performed for Saldanha Bay Municipality (SBM)), dated June 2024 and the Sewer Master Plan dated June 2024.

The proposed development on portion 20 was conceptually taken into consideration as part of future development area P4 in the June 2024 master plans for the Paternoster water and sewer networks. Development on portion 17 was not taken into consideration in the June 2024 master plans.

1. WATER DISTRIBUTION SYSTEM

1.1 Distribution zone

The water master plan indicated that the proposed development areas should be accommodated in the existing Paternoster reservoir water distribution zone. The connections to the existing water system should be made to the existing 200 mm Ø pipe in Mosselbank Street for portion 17, and to the existing 150 mm Ø pipe in Saint Augustine Road for portion 20, as shown in Figure 1 attached.

The proposed development is situated inside the water priority area.

GLS Consulting (Pty) Ltd

T +27 21 880 0388
E info@gl.co.za
W gl.co.za

15 Termo Lane
Techno Park
Stellenbosch, 7600

Hilda Chambers Building, Suite 1
339 Hilda Street
Hatfield, Pretoria, 0083

PO Box 814
Stellenbosch, 7599
South Africa

1.2 Water demand

The original water analysis for the master plan was performed with a total annual average daily demand (AADD) of 1,6 kL/d for portion 17 of Farm 23 and 1,6 kL/d for portion 20 of Farm 23.

For this re-analysis, the AADD and fire flow for the proposed development were calculated as follows:

- Farm 23/17:
 - Hotel (62 units @ 0,3 kL/d/unit ⁽¹⁾) = 18,6 kL/d
 - 626 m² Restaurant area @ 0,65 kL/d/100 m² ⁽¹⁾ = 4,1 kL/d
 - Sub-total = 22,7 kL/d
- Farm 23/20:
 - 33 Residential units @ 0,45 kL/d/unit ⁽¹⁾ = 14,9 kL/d
- Total = 37,6 kL/d
- Fire flow criteria (Moderate risk 2) ⁽¹⁾ = 25 L/s @ 10 m

⁽¹⁾ As per Tables J.2, J.4 & J.17 from Section J - Water Supply of "The Neighbourhood Planning and Design Guide" (so called "Red book").

1.3 Present situation

1.3.1 Reticulation network

The existing water reticulation system of the Paternoster reservoir water distribution zone has sufficient capacity to accommodate the proposed development on portion 17 of Farm 23 to comply with the pressure and fire flow criteria as set out in the master plan. Upgrading of the existing 100 mm Ø pipeline in Saint Augustine Road will, however, be required to accommodate the proposed development on portion 20 of Farm 23.

Link services item PRW1.7 will be required to connect portion 20 of Farm 23 to the existing Paternoster reservoir water distribution network, as shown in Figure 1 attached.

Link services:

- PRW1.7 : 120 m x 160 mm Ø Pipe to install R 245 000 *

Notes:

(* Including P & G, Contingencies and Fees, but excluding VAT - Year 2025/26 Rand Value. This is a rough estimate, which does not include major unforeseen costs).

The route of the proposed pipeline is schematically shown in Figure 1 attached, but has to be finalised subsequent to a detailed pipeline route investigation.

1.3.2 Bulk supply

The Paternoster reservoirs are supplied with bulk water from the Vredenburg reservoirs in Vredenburg. The existing bulk supply system between Vredenburg and Paternoster has sufficient capacity to accommodate the proposed development.

1.3.3 Reservoir capacity

The criteria for the total reservoir volume used in the Paternoster Water Master Plan is 48 hours of the AADD (of the reservoir supply zone).

In the latest water master plan, the AADD of the Paternoster reservoir is calculated at 778 kL/d.

The storage volume of the existing Paternoster reservoirs is 4 300 kL, which results in a current reservoir storage capacity of 133 hours of the AADD served. There is thus sufficient storage capacity at the Paternoster reservoirs in order to accommodate the proposed developments within the supply area.

1.3.4 WCDM bulk supply

Paternoster is supplied with water from the SBM's Paternoster reservoirs, which in turn are supplied with bulk water from the Vredenburg reservoirs in Vredenburg. The Vredenburg reservoirs are supplied with bulk water from the West Coast District Municipality's (WCDM's) Besaansklop reservoir via the SBM's Vredenburg-Besaansklop pump station (PS) through a 400 mm Ø bulk pipeline. The PS is supplied with bulk water through meter no. WC33/1.

The impact of the proposed development on the existing infrastructure of the WCDM system upstream of meter WC33/1 is discussed in a separate report, addressed to WCDM.

1.4 Implementation of the master plan

The following master plan item will be required to improve network conveyance in the existing Paternoster reticulation system to accommodate the proposed development on Farm 23/20, as shown in Figure 1 attached:

Network upgrades

- PRW1.8 : 160 m x 200 mm Ø Replace existing 110 mm Ø pipe R 417 000 *

Notes:

(* Including P & G, Contingencies and Fees, but excluding VAT - Year 2025/26 Rand Value. This is a rough estimate, which does not include major unforeseen costs).

The route of the proposed pipeline is schematically shown in Figure 1 attached, but has to be finalised subsequent to a detailed pipeline route investigation.

1.5 Minimum items required

There is sufficient capacity in the existing water network to accommodate the proposed development on Farm 23/17.

The minimum upgrades required to accommodate the proposed development on Farm 23/20 in the existing water system are link services item PRW1.7 in order to connect Farm 23/20 to the existing Paternoster reservoir water distribution network, and master plan item PRW1.8 to reinforce the existing network.

2. SEWER NETWORK

2.1 Drainage area

Portion 17 of Farm 23 falls within the existing Mosselbank pumping station (PS) drainage area. The recommended sewer connection is to the existing 150 mm Ø outfall sewer in Kiewiet Street. Portion 20 of Farm 23 falls within the existing Paternoster Bulk PS no. 1 drainage area. The recommended sewer connection is to the existing 160 mm Ø outfall sewer in Visvanger Street, as shown in Figure 2 attached.

The development is inside the sewer priority area.

2.2 Sewer flow

The original sewer analysis for the master plan was performed with a total peak day dry weather flow (PDDWF) of 1,3 kL/d for portion 17 of Farm 23 and 1,3 kL/d for portion 20 of Farm 23.

For this re-analysis, the PDDWF for the proposed development was calculated as follows:

• Portion 17 of Farm 23	=	18,2 kL/d
• Portion 20 of Farm 23	=	<u>11,9 kL/d</u>
Total	=	30,1 kL/d

2.3 Present situation

Sewage from the Mosselbank PS drainage area gravitates to the Mosselbank PS from where it is pumped to the Paternoster Bulk PS 1 drainage area through a 110 mm Ø rising main. From Paternoster Bulk PS 1, sewage is pumped to Paternoster Bulk PS 2 through a 100 mm Ø Asbestos Cement (AC) rising main, and from Paternoster Bulk PS 2 directly to the Paternoster Wastewater Treatment Plant (WWTP) through a 250 mm Ø rising main.

The capacities of the Mosselbank and Paternoster Bulk no. 1 pumping stations were indicated in the latest sewer master plan as 5,1 L/s and 10 L/s respectively. The anticipated maximum upstream flows at the Mosselbank and Paternoster Bulk no. 1 pumping stations are 1,3 L/s and 10,5 L/s respectively.

There is thus insufficient capacity at Paternoster Bulk PS 1 to accommodate sewage from the proposed developments.

2.4 Implementation of the master plan

The master plan proposes that Paternoster Bulk PS 1 be upgraded.

The following items are proposed in the June 2024 sewer master plan to improve the capacity of the existing sewer system in order to accommodate the proposed development areas together with other future developments, as indicated in Figure 2 attached:

Network infrastructure

• SPS2.4	: Upgrade existing PS to 30 L/s	R	1 136 000 *
• SPS2.5	: 958 m x 200 mm Ø new rising main	R	<u>1 925 000 *</u>
Total		R	3 061 000 *

(* Including P & G, Contingencies and Fees, but excluding VAT - Year 2025/26 Rand Value. This is a rough estimate, which does not include major unforeseen costs).

The route of the proposed rising main should be finalised subsequent to a detailed pipeline route investigation.

2.5 Minimum items required

The minimum upgrades required to accommodate the proposed development of Farm 23/17 and Farm 23/20 in the existing Paternoster sewer network are master plan items SPS2.4 and SPS2.5 in order to improve the capacity of the existing sewer system.

3. CONCLUSION

The developer of portions 17 & 20 of Farm 23 in Paternoster may be liable for the payment of a Development Contribution (as calculated by the Saldanha Bay Municipality) for bulk water and sewer infrastructure as per Council Policy.

The water master plan indicated that the proposed development areas should be accommodated in the existing Paternoster reservoir zone. The connections to the existing water system should be made to the existing 200 mm Ø pipe in Mosselbank Street for portion 17 of Farm 23, and to the existing 150 mm Ø pipe in Saint Augustine Road for portion 20 of Farm 23, as shown in Figure 1 attached.

The existing water reticulation system of the Paternoster reservoir water distribution zone has sufficient capacity to accommodate the proposed development on portion 17 of Farm 23 to comply with the pressure and fire flow criteria as set out in the master plan. Link services item PRW1.7 will, however, be required to connect portion 20 of Farm 23 to the existing Paternoster reservoir water distribution network, and master plan item PRW1.8 will be required to replace a 100 mm Ø pipe in Saint Augustine Road in order to accommodate Farm 23/20 in the existing water system.

The Paternoster reservoirs are supplied with bulk water from the Vredenburg reservoirs in Vredenburg. The existing bulk supply system between Vredenburg and Paternoster has sufficient capacity to accommodate the proposed development.

The existing Paternoster reservoirs have sufficient spare capacity to accommodate the proposed development.

The existing Paternoster sewer reticulation system has insufficient capacity in order to accommodate the proposed development in the existing sewer system.

The minimum upgrades required to accommodate the proposed development areas on portions 17 & 20 of Farm 23 in the existing Paternoster sewer network are master plan items SPS2.4 and SPS2.5 in order to improve the capacity of the existing sewer system.

We trust that you find this of value.

Yours sincerely,

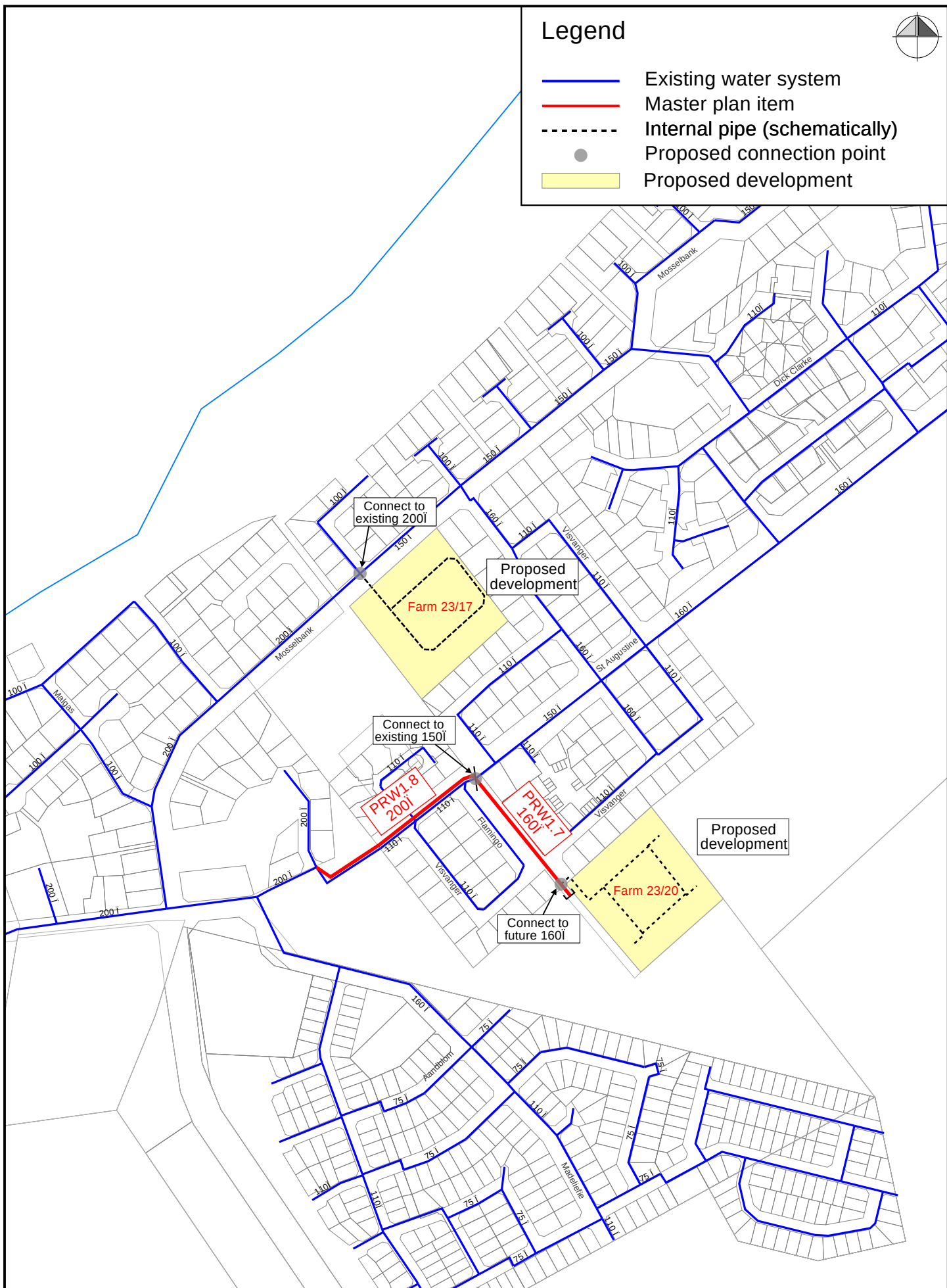
GLS CONSULTING (PTY) LTD
REG. NO.: 2007/003039/07



Per: PC DU PLESSIS

cc. The Director: Technical Engineering Services
Saldanha Bay Municipality
Private Bag X12
Vredenburg
7380

Attention: Mr Gavin Williams



5 February 2026

The Director Technical Services
West Coast District Municipality (WCDM)
P.O. Box 242
Moorreesburg
7310

Attention: Mr Michiel Visser

Dear Sir,

**PROPOSED RESIDENTIAL DEVELOPMENT ON PORTIONS 17 & 20 OF FARM 23, PATERNOSTER:
IMPACT ON THE WCDM WATER SUPPLY SYSTEM**

The request by Mr Louren du Plooy of Vaalplaas DevCo to comment on the capacity of the WCDM bulk water supply system to serve the proposed development on portions 17 & 20 of Farm 23 in Paternoster, within the Saldanha Bay Municipal (SBM) area, refers.

1. EXTENT OF DEVELOPMENT

The total annual average daily demand (AADD) required for the development is calculated as 37,6 kL/d.

The location of the proposed development in SBM is shown in Figure 1 attached.

This document should, inter alia, be read in conjunction with the following reports:

- Bulk Water Master Plan (performed by GLS for the West Coast District Municipality), dated June 2023.
- Risk of Supply Analysis of the West Coast District Municipality's Withoogte and Swartland Bulk Water Supply Systems, dated March 2025.

The master plan indicated that the proposed development area on portions 17 & 20 of Farm 23 in Paternoster should be supplied with water from the Paternoster reservoirs, which are supplied from the Vredenburg bulk water system. The Vredenburg water system is supplied with bulk water from the Besaansklip system, operated by WCDM.

The latest bulk water meter data available for this investigation was data obtained from WCDM for the financial year ending June 2025. The AADD recorded at the WCDM meters supplying water to the Vredenburg reservoirs (meter no. WC33/1) was approximately 6 347 kL/d for the financial year ending June 2025. The increase in water demand due to the proposed development will be in accordance with that allowed for in the water master plan.

GLS Consulting (Pty) Ltd

T +27 21 880 0388
E info@gl.co.za
W gl.co.za

15 Termo Lane
Techno Park
Stellenbosch, 7600

Hilda Chambers Building, Suite 1
339 Hilda Street
Hatfield, Pretoria, 0083

PO Box 814
Stellenbosch, 7599
South Africa

2. WATER SYSTEM

2.1. Distribution system

The development falls within SBM's Paternoster reservoir water distribution zone. The Paternoster reservoirs are supplied with water from the Vredenburg reservoirs (old 4 500 kL Van Enkhuizen reservoir and new 8 000 kL Vredenburg reservoir) in Vredenburg.

The Vredenburg reservoirs are supplied with water from meter no. WC33/1 on the WCDM's system but can also be supplied via meter no. I1. Meter no. WC33/1 is connected to a 500 mm Ø WCDM pipeline supplied from the Besaansklip reservoir and supplies water to the SBM's Vredenburg-Besaansklip pump station (PS). From the Vredenburg-Besaansklip PS water is pumped directly to the Van Enkhuizen reservoir through a 400 mm Ø bulk pipeline.

Meter no. I1 is connected to the 900 mm Ø WCDM pipeline between the Besaansklip and Vergeleë reservoirs. From meter I1 water is supplied through a 300 mm Ø SBM bulk pipeline to the Vredenburg-Langeenheid PS in Vredenburg, from where water is pumped to the Van Enkhuizen reservoir. The connection through meter no. I1 is currently only used as a back-up option.

The impact of the proposed development on the existing infrastructure of SBM is discussed in a separate report, addressed to SBM.

2.2. Reservoir capacity

The Besaansklip reservoir (located between Saldanha and Vredenburg) supplies bulk water to the Vergeleë reservoirs (located between St Helena Bay and Vredenburg), and the two reservoir sites are operated as one system within the bigger Withoogte system. The current combined storage capacity of the two reservoir sites is 95 hours of the AADD of the reservoir supply areas and is therefore sufficient in the medium term.

It should however be noted that it is proposed in the Saldanha Bay bulk water master plan that the 2 older 4,5 ML reservoirs at the Vergeleë reservoir site are decommissioned (they are in a bad state of repair and require upgrading) and replaced with a new 20,0 ML reservoir (replace existing 2 x 4,5 ML reservoirs storage volume plus an additional 11,0 ML reservoir storage volume).

The impact of the proposed development on the supply capacity of the Besaansklip & Vergeleë reservoir zone is relatively small in relation to the storage volume of 108,0 ML for the Besaansklip & Vergeleë reservoirs.

2.3. Bulk supply

The Besaansklip reservoir is supplied with bulk water from the Withoogte Water Treatment Plant (WTP) through a 1 200 mm Ø bulk pipeline. The 1 200 mm Ø feeder main to the Besaansklip reservoir is not significantly impacted by the development.

2.4. Water treatment capacity

The existing Withoogte WTP has a current treatment capacity of 72,0 ML/d.

The recorded AADD treated at the Withoogte WTP during the 2024/25 financial year was 44 808 kL/d.

Monthly flow measurements of bulk water treated at the Withoogte WTP from July 2003 to June 2025 indicates that the peak monthly demand for the Withoogte WTP is on average 1,19 times the AADD and experienced in the month of February.

The recorded peak monthly demand for the Withoogte WTP during the 2024/25 financial year was 55,23 ML/d. With a calculated ratio of peak week demand to peak month demand of 1.158, the current theoretical peak week demand for the Withoogte WTP is calculated at 63,95 ML/d (88,8% of WTP capacity)

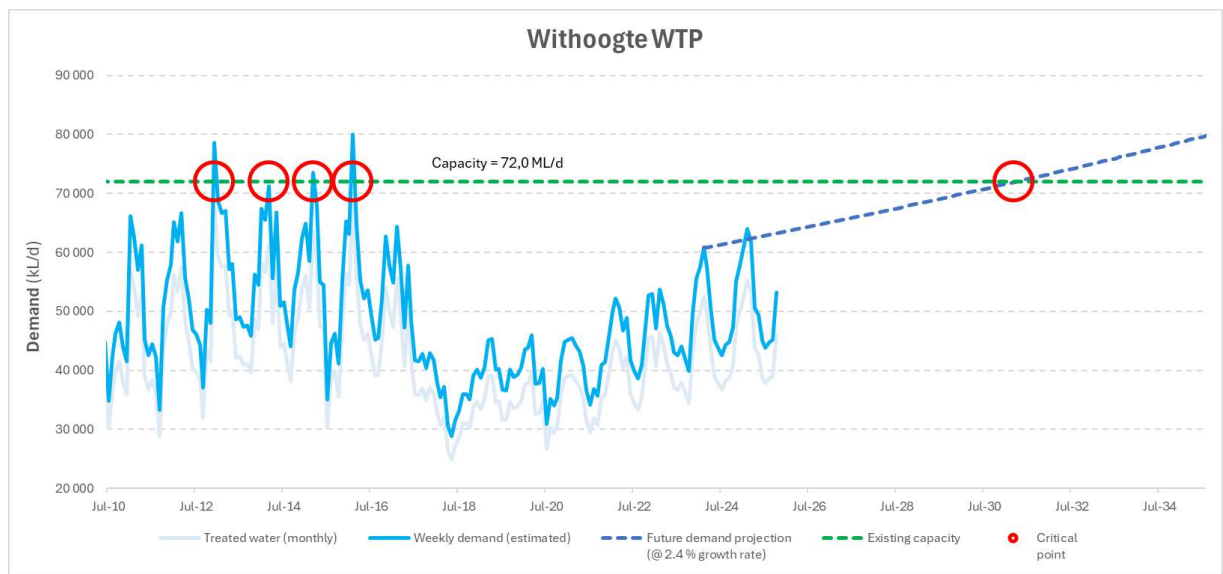
Allowance should however be made in the spare capacity of the WTP to also accommodate the potential water demand of all existing registered erven within SBM and Bergrivier Municipality (BM) (supplied with water from the Withoogte WTP) which are currently vacant. This scenario (where all vacant erven are developed) is called the “existing fully occupied” scenario.

The calculated theoretical fully occupied peak weekly demand for the Withoogte system is calculated as 73,86 ML/d, which is more than the capacity of the treatment plant. Peak demand to the system can, however, be augmented through the Langebaan Road and Hopefield aquifers, with a safe yield of 12,4 ML/d.

The development can therefore only be accommodated in the existing system if the capacity of the Withoogte WTP is increased, or alternatively if the deficit in treatment capacity is provided from an alternative source such as the existing groundwater sources.

The Withoogte WTP has reached capacity prior to the drought that has been experienced in the region between 2017 and 2019, as can be seen in Figure 2 below. Peak demand is however currently lower than the capacity of the plant.

Figure 2: Withoogte water treatment plant:



It is estimated that the capacity will be exceeded during the 2030/31 financial year (within the next 5 to 10 years). The peak week demand should however be verified by the WCDM.

2.5. Permitted water allocation

The WCDM Withoogte bulk water system (which supplies bulk water to the Swartland, Saldanha Bay and Bergrivier Municipalities) has a current permitted water allocation from the Berg River of 23 440 ML/a.

The recorded raw water abstraction during the 2024/25 financial year from the Berg River for the Withoogte system was 17 570 ML, which is less than the current allocation.

3. BULK CONTRIBUTIONS

The developer of the proposed development on portions 17 & 20 of Farm 23 in Paternoster may be liable for the payment of a Development Contribution (as calculated by the Saldanha Bay Municipality) as a contribution towards water infrastructure of the WCDM system as per Council Policy.

4. CONCLUSION

The impact of the proposed development on portions 17 & 20 of Farm 23 in Paternoster on the WCDM supply infrastructure is considered to be insignificant. No upgrading to the WCDM system upstream of the Vergeleë reservoirs is required as a direct result of the development.

Based on the potential water demand of existing erven in the Withoogte bulk water system that have development rights, the Withoogte WTP has insufficient spare capacity available to accommodate the proposed development. The development can therefore only be accommodated in the existing system if the capacity of the Withoogte WTP is increased, or alternatively if the deficit in treatment capacity is provided from an alternative source such as the existing groundwater sources.

The recorded raw water abstraction during the 2024/25 financial year from the Berg River for the Withoogte system was 17 570 ML, which is less than the current allocation for the system of 23 440 ML/a.

We trust that you find this of value.

Yours sincerely,

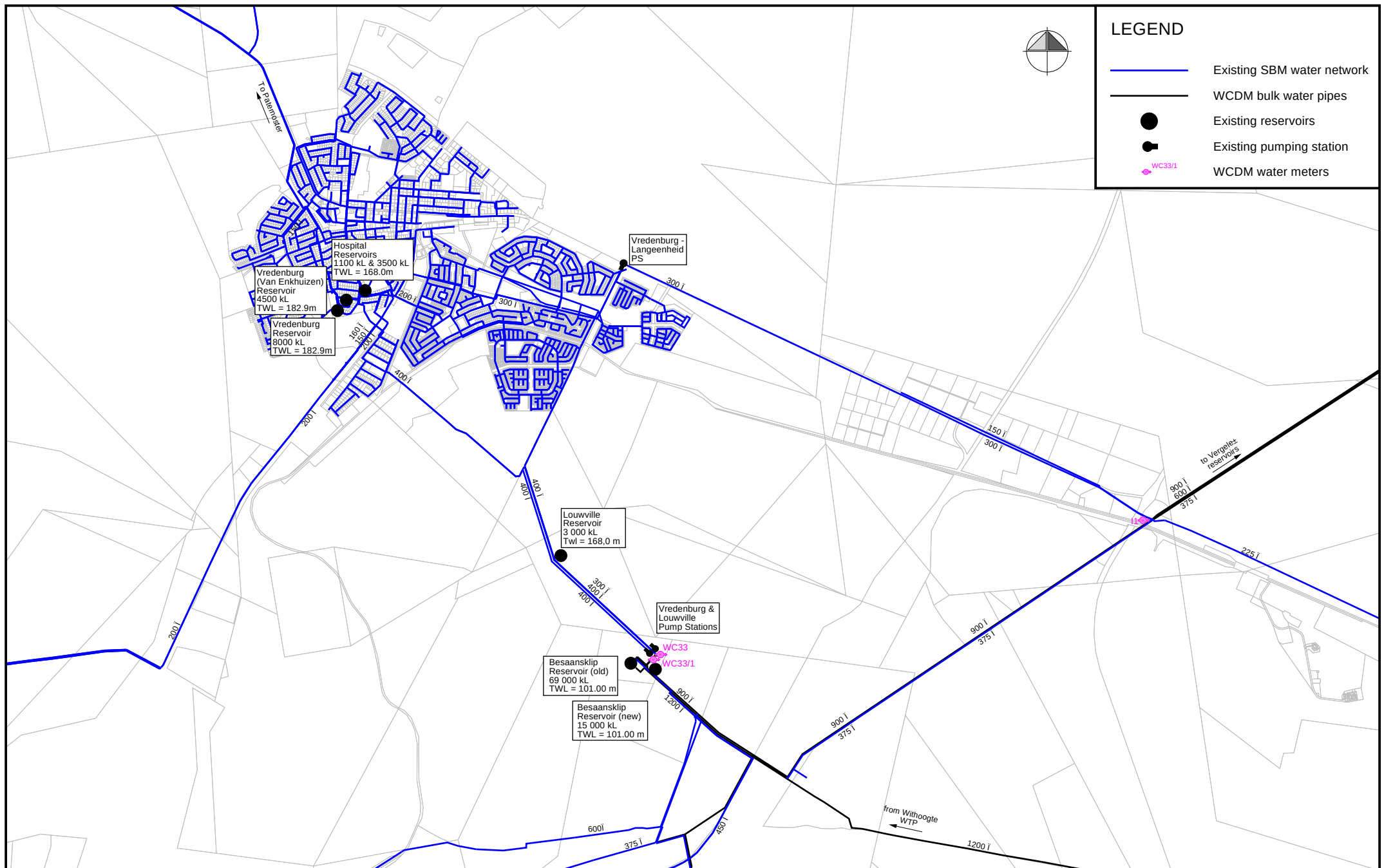
GLS CONSULTING (PTY) LTD
REG. NO.: 2007/003039/07



Per: PC DU PLESSIS

cc. Vaalplaas DevCo
66 Kompas Street
Paternoster
7381

Attention: Mr Louren du Plooy



LEGEND

- Existing SBM water network
- WCDM bulk water pipes
- Existing reservoirs
- Existing pumping station
- WCDM water meters