

MULTI-USE DEVELOPMENT OF ERF RE1627 SEDGEFIELD

ENGINEERING SERVICES (Preliminary Report for Layout 10)

4 August 2025

Rev. 1

Prepared for: **Developers of erf RE1627**

Scarab Village (Pty) Ltd

PO Box 499

Sedgefield 6573

Att: Mr Clifford Elion

Email: cliffprop@gmail.com

Tel.: 082 678 9900

Cc: Ecoroute Environmental Consultancy (Ms J. Ebersohn)

Prepared by:



Amblewood Complex

Main Road North

PO Box 178

Sedgefield 6573

Tel: 044 343 2093

Cellphone: 083 292 9047

Email: fraser@fcce.co.za

Report AF1180-1-r1

Fraser Consulting Civil Engineering cc 2005/074572/23 t/a: FRASER Engineers.

A.L. Fraser Pr. Eng., M.Sc. Eng (UNatal), MBA (UCT), MSAICE, ECSA reg. 940107

CONTENTS

1. Introduction
2. Access
 - 2.1 External Access
 - 2.2 Internal Access
3. Stormwater Management
4. Water Reticulation
5. Sewerage Management
6. Solid Waste Management
7. Flood Mitigation Measures
8. Summary

References

List of Tables

1. Extent of Proposed Development
2. Residential Water Demands
3. Water Demands from Municipality
4. Sewage Loads
5. Solid Waste Management

Appendices

- A. Photographs

Drawings

Sub-1627/10	ERF 1627 SEDGEFIELD: PROPOSED SUBDIVISION PLAN NR. 10
AF1180-Fig 1-r0	Locality Plan (A3)
AF1180-Fig 2-r1	Layout (A3)
AF1180-Fig 3-r1	Water Reticulation Conceptual Layout (A3)
AF1180-Fig 4-r1	Sewerage (A3)

Abbreviations:

CCT	City of Cape Town
FGL	Finished Ground Level
m amsl	metres above mean sea level
NGL	Natural Ground Level
RI	Recurrence Interval

This Report has been prepared by Fraser Consulting Civil Engineering cc with all reasonable skill, care and diligence within the terms of SAACE Form of Agreement for Consulting Civil Engineering Services (2004) and taking account of the resources devoted to it by agreement with the Client. We disclaim any responsibility to the Client and Others in respect of any matters outside the scope of the above. The report/drawing is confidential to the Client and we accept no responsibility of whatsoever nature to the third parties to whom this report/drawing or any part thereof is made known. Any such party relies on the report/drawing at their own risk.

Revision Table

Rev.	Date	Details
0	21 Aug 2023	Layout Plan 8; STED sewerage system
1	4 August 2025	Layout Plan 10; sealed sewerage system;

1. Introduction

We refer to the proposed development of erf RE1627 Sedgefield. The property is situated within the area known as The Island (Sedgefield Extension 1) and located between Montage Village to the East, Scarab Village to the West, Island Village to the South, and the N2 National Road to the North, as shown by Figure AF1101-1. The proposed layout is presented by Messrs Planning Space Town and Regional Planners: Erf 1627 Sedgefield: Proposed sub-Division number 10. This drawing is attached to this Report.

Fraser Engineers were asked to provide information on the proposed servicing of the erf.

The erf RE1627 is 26.6 ha in extent.

The site is in the low lying areas of Sedgefield and falls below the 5m contour. The topography is described by Drawing AF1180-FIG-2 revision 1.

The extent of the proposed development is shown in Table 1 below.

Table 1. Extent of Proposed Development

Ref	Zoning	Area (ha)	No. of Residential Units (Approx.)
1	General Residential I (Group Housing)	3.67	70
2	Open Space III (Conservancy which forms part of the residential estate)	16.34	0
3	Transport Zone III (Private Road)	1.18	0
4	Open Space II Recreation facilities with consent for tourist facilities and urban agriculture. To be consolidated with erf 4308.	5.43	0
5	Total	26.62	165

The objective of this preliminary report is for the Developer to complete an impact assessment report. This will then be followed by a Full Engineering Services Report.

2. Access

2.1 External Access

Access to the Group Housing area of 70 units will be from the Dr Malan Street south of the Perdespriut causeway. DR Malan This road is lightly trafficked and has ample reserve capacity. The sight distances are good.

2.2 Internal Access

The internal Access Roads will be generally 4m wide in 12m wide reserves, though in roadways servicing less than 10 erven, the road widths will be 3m wide in 10m wide reserves.

The roads will be paved with 80mm thick interlocking pavers. To disperse stormwater the roads will be cambered to both sides, and the roads will have E1 edging on either side. The E1 edging will be flush with the roadway to allow stormwater runoff to disperse either side of the roadway.

The road layerworks will be decided after the geotechnical assessment. Typical layerworks are 80mm pavers on 20mm bedding later on 200mm G5 gravel on 300mm in-situ selected subgrade.

3. Stormwater Management

The stormwater system will be designed in accordance with the principles of Sustainable Drainage Systems (SuDS). The system should as much as possible mimic the natural system.

The drainage from the roofs will be directed towards rainwater tanks. The overflows from the rainwater tanks will be directed to underground soakaways.

The roadways will drain sideways to 1m wide grassed swales either side of the roadway. The grassed swales will remove any phosphorus by natural filtration.

The swales will have minimal grades similar to the flat topography of the area. Water will not flow along the swale but will infiltrate directly to the highly porous soil. In this way no litter will be transported from source by stormwater runoff.

4. Water Reticulation

The development will be supplied from two sources, viz.:

- i) Shallow boreholes or “spikes” which are approximately 1.4m deep below ground; and
- ii) Municipal treated water supply

The open space and transport zones will be supplied only by shallow boreholes.

We refer to the Red Book (2004) for the water demands. The average erven size for the Group Housing is 522m². From Figure 9.9 of the Red Book (2004) we expect the typical water demands of the erven to be shown as in Table 2 below.

Table 2 Residential Water Demands

Ref	Zoning	Water Demand
1	General Residential I (Group Housing)	700 l/day

Table 3 below presents the total demands of the municipal supply.

Table 3 Water Demands from Municipality

Ref	Type of Development	No. residential units	Nett demand per erf	Demand from Municipality
1	Group Housing	70	700 l/day	49 kl/day
3	Total	70		49 kl/day

Drawing AF1180-FIG-3 revision 1 shows the conceptual water reticulation layout. The draw-off point is from the diameter 160mm watermain that feeds the Sedgefield Island. The draw-off point is along the Dr Malan Street, almost immediately south of the causeway.

We refer to the Element-GLS (2016) Water Masterplan for Knysna. Drawing KWM 6.2b shows the residual water pressures for the Sedgefield Water Reticulation network. The residual pressures for the Island watermain are between 40m and 60m which is well above the minimum residual head required of 24m under instantaneous peak demands (Red Book (2004)). This indicates that there should be sufficient supply capacity in the pipeline. This must be confirmed during the Full Engineering Services Report Stage.

The conceptual layout shows a diameter 110mm pipeline leading to a diameter 90mm spur line along the axis of the Group Housing erven. From these spur lines, diameter 75mm pipelines service the erven alongside cul-de-sacs.

5. Sewerage Management

The site is extremely flat like the adjacent Island Village. The ground levels vary between 2.5m amsl and 3.1m amsl. Over and above this the water table is fairly high due to the porous soils and the proximity of

the Estuary. At times of open river mouth the water table could be as high as 0.7m amsl, and at the times of closed river mouth, when the Estuary water level rise, the water table could be as high as 1.3m amsl to 2.0m amsl.

Therefore it is necessary to have sewers at shallow depths. The proposed system is an enclosed system where each house has a 1 m³ tank that has a stainless steel sewage cutter pump that pumps the sewage to one central bulk sewage pumping station, PS 1. The proposed pressure mains range from diameter 75mm pipes to diameter 110mm diameter pipes. The proposed pipelines will be HDPE class PE80.

The conceptual sewage system layout is shown on the Drawing AF1180-FIG-4 revision 1.

From the bulk sewage pumping station it is proposed to pump the sewerage from erf 1627 to the rising main connecting Island Village with the Sedgefield Municipal system. The detail of this connection and the capacity of the downstream system will form part of the Service level Agreement Planning. The rising main sewer from the pump station is designed around accepting sewage from a STED system and will not take effluent from a conventional system. This is another reason for a macerator pump in each household.

Sewage loads are calculated as a proportion of the water consumption, with approximately 75% of the water consumption being discharged to the sewage system. Therefore the loads are as described in Table 4 below.

Table 4. Sewage Loads

Ref	Type of Development	Water Demands	Nett Sewage Loads	No. of erven	Load to the Municipal System
			75%		
	Group Housing	700 l/day	525 l/day	70	36.75 l/day
	Total				36.75 kl/day

6. Solid Waste Disposal

It is proposed that the Group Housing area have solid waste collected at their erven by the Municipal waste truck, The residents will use different colour bags for general and recyclable waste.

The volume of waste is typically 0.15m³/week/household in an uncompacted/loose form for an average Group Housing household. Table 5 below shows that the total waste per week will be in the order of 10.5 m³/week.

Table 5. Solid Waste Management

Ref	Type of Development	Waste Load/week/household	No of erven	Gross Loads to Municipal System
	Group Housing	0.15 m ³ /week	70	10.5 m ³ /week
	Total Load to Municipal System			10.5 m ³ /week
	Volumes are in uncompacted or loose form			

7. Flood Mitigation Measures

We refer to the Photographs of Appendix A. The area of erf RE 1627 has been historically flooded.

We refer to the Flood Management Study Report produced by Fraser Engineers cc (Fraser (2024)). The Report estimates the 100 year Recurrence Interval (RI) flood level as 3.10m amsl and recommends that the floor levels are at a minimum of 3.6m amsl. It is of vital importance that the river mouth is artificially breached in the anticipation of potential flooding.

The water and stormwater facilities will require no protection. The sewer services will be protected to the 100 year RI flood levels. To this end all openings to the sewer system such as manhole covers will be above the 100 year RI level.

8. Summary

Based on preferred Option 10 the following are the demands and loads that will be placed on the Municipal system by the development of erf RE 1627:

- I. Water Demand: 49.0 kl/day
- II. Sewage Load: 36.75 kl/day
- III. Solid Waste: 10.5 m³/week.

Please contact ourselves for any further information.

Yours faithfully



Alastair Fraser Pr. Eng

References:

Element GLS (2016). Knysna Water Masterplan. GLS Consulting (Pty) Ltd, PO Box 814, Stellenbosch 7599. Tel: 021 8 800 388; info@gl.co.za

Fraser (2025). Multi-use Development of erf RE1627 Sedgefield: Flood Management Study. Fraser Engineers, PO Box 178, Sedgefield, 6573. Tel: 083 292 9047. fraser@fcce.co.za

Red Book (2004). Guidelines for Human Settlement Planning and Design. Compiled under the Department of Housing by CSIR Building and Construction Technology.

Appendix A. Photographs



Photograph A1. August 2006: the Perdespruit causeway backs up water upstream to Montage Village and erf RE1627 . The area of the Group Housing area is not flooded



Photograph A2. November 2007: the area of the Group Housing north-west of bowling club is not flooded.



Photograph A3. November 2007: Low lying areas flooded, high lying areas not flooded