

INFRASTRUCTURE AND MAINTENANCE HISTORY

1 Roads

1.1 Background

The Springerbaai Eco-Estate was originally developed on the southern part of the farm Klipfontein 249 along the coast, in extent approximately 264 hectares ("the Development"). At the time, the Developer owned the Remainder of Portion 7 of the farm Klipfontein 249, in extent 171 hectares ("the Farm").

The Development and the Farm therefore covers 435 hectares.

In order to gain access to the Development from the tarred road from PetroSA to Vleesbaai, a Servitude Road (8 metres wide) was registered over the Farm in favour of the Development (LG Map nr 1204/2002). The Development and owners of all erven are entitled to use the Servitude Road over the Farm.

The HOA purchased the Farm from the Developer on 20 December 2003. The Farm was registered in the name of the HOA on 3 November 2006.

The Developer appointed MVD as the Consulting Engineers for all services on the Development. Because of the phased nature of the development, several road contracts were put out on tender. The two successful contractors were Henra and Marracon, who built all the roads at Springerbaai according to the designs of MVD, and under their supervision. Regular maintenance was done by the Developer in terms of routine maintenance (filling of potholes and cleaning drains), as well as periodic maintenance to maintain the structural integrity of the roads (this included the resurfacing of the main road up to phase 1 during 2005). The Developer will also, as part of this programme, resurface the main road from phase 1 to phase 5 as part of the Phase 6 roads construction, once a final decision has been made by the authorities in this regard.

MVD Consulting Engineers estimate that there are 11,2 kilometres of roads on the Estate.

Springerbaai Estate is therefore no ordinary seaside resort with a few erven linked by a road or two. A member is not only the owner of an erf of approximately 2 500 square metres, but is also a member of a HOA which ultimately owns 435 hectares of farmland and public areas (less the areas occupied by the 117 erven) plus at least 11,2 kilometres of roads. This is what each member acquired when he/she purchased an erf in the Development.

1.2 Conditions of approval

The Developer had to meet a number of conditions in terms of the approval of the Development by the authorities. As far as roads are concerned, the Development was approved subject to the following two conditions set out in an annexure to a letter from the Provincial Administration: Western Cape Community Service Branch dated 14 October 1994, which were amended by the South Cape District Council on 10 July 2000:

- *That the 3km access road to the Development be supplied with a gravel surface (“gruisoppervlak”) with a driving width of at least 5,5 metres;*
- *That at least the main internal service road (“interne hoofbedieningspad”) must also be supplied with a gravel surface.*

The Springerbaai road network was designed and constructed to meet this requirement.

1.3 Construction of roads

All roads were constructed according to the designs of MVD, and under their supervision. The design approach was to keep the road surface as close as possible to natural ground level, and to use “driffies” to channel stormwater off the road, as well as to serve as traffic calming devices to reduce speeds as much as possible. This approach was followed to keep the overall development as natural and eco friendly as possible.

An inspection was done by the Developer after the abnormal rains and flooding in the Garden Route in 2006. It was found that, compared to the surfaced roads in the area, minimal flood damage was incurred.

1.4 Status in 2006

The Trustees had a special meeting on 25 September 2006 to consider the roads and the consequences of their takeover by the HOA. The following points were discussed amongst others, at the meeting:

- Any road, whether tarred or gravel, needs to be maintained with a view towards minimizing the costs over the longer term;
- The road maintenance functions previously undertaken by the Developer, will in future be the responsibility of the HOA;
- Maintenance costs are influenced by amongst other the following: the composition of the traffic, the speed of the vehicles, road and drainage design, natural site conditions and weather;

- The most economical maintenance over the longer term will be achieved if it is done according to a maintenance management plan developed by road engineers;
- In the light of the development of Phase 6, and in line with the then Developer's road Maintenance Plan, the main road between Phase 1 and Phase 5 were resurfaced by the developer at his cost.
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The Trustees decided to approach MVD Consulting Engineers for a proposal regarding a maintenance management plan, with associated costs, for the future. The MVD proposal is summarized in the following section, and the associated cost estimates were included in the proposed budget for 2007.

1.4.1 The MVD Road Maintenance Management Proposal (12 Sept 2006)

strategy

1.4.1.1 Professional fees quoted by MVD

- | | |
|-----------------------------------|-----------------------|
| • Training of Springerbaai Staff: | R 1 000 |
| • Three monthly road inspections: | R1 000 per inspection |
| • Annual Maintenance: | R4 000 |
| • Five yearly regravell | R10 000 |

Fees exclude VAT and are to be escalated by 10 % pa

1.4.1.2 Maintenance Management

➤ **Monthly Maintenance**

- Monthly inspection by Springerbaai staff, repairing potholes, clearing drainage channels, spraying of weeds growing on the road surface
- All roads to be inspected after rains to establish damage, and to repair such damage. MVD to obtain quotes in case of severe damage.

➤ **Annual maintenance**

- All roads to be graded once per year. Total costs estimated at R8 250/km x 11.2 = R92 400. (MVD gave a breakdown of phases and this can be used to refine the estimate)
- At annual inspection, the resurfacing date will be reviewed

➤ **Rehabilitation programme**

- All roads to be re-gravelled with 50 mm of gravel every 5 years at 3080 cub meters @ R172.50 per m³ and “driffies” @ R2500 each = Total **R656 300**.

1.4.2 Mandate to MVD

The Trustees have given MVD a mandate for 2007 to:

- train staff to do monthly maintenance, at a fee of R1 000 excluding VAT;
- visit Springerbaai quarterly and inspect the roads, at a fee of R1 000 excluding VAT per visit;
- report to the Trustees annually with recommendations in respect of annual maintenance to be done by a contractor, with specifications and a cost estimate, including supervision of work done, at a fee of R4 000 excluding VAT;
- supervise major resurfacings at a fee of R10 000 excluding VAT;
- report to the Trustees on urgent road matters that require immediate attention as and when they arise.

The quoted fees are 2006 figures and will increase by 10% on 1 January of every year unless otherwise agreed.

The purpose of this mandate to MVD is:

- to have professionals involved to set the necessary standards during the period of take-over;
- to hold the professionals responsible for their services;
- to have professionals issuing specifications and instructions to contractors, and monitoring the work done.

Once these matters have been properly benchmarked, it is hoped that we will have a member Trustee elected with a civil engineering background who is readily accessible, has time available and can accept responsibility for these matters.

1.4.3 Consequences for Budgets and Levies

The foregoing matters will have major consequences for all future budgets and levies of the HOA. The Trustees recommended the following approach in respect of road related matters for the 2007 budget and thereafter, and this approach was approved by the 2006 AGM:

▪ **Road Capex Reserve Fund**

The main internal service road (running behind phases 1 to 6) will be resurfaced at the developer’s cost, estimated by MVD at about R243 520 (in present value terms), excluding VAT. The resurfacing costs for 2010 estimated by MVD above at R656 300, would therefore reduce by such amount to say R412 800 (in present value terms), excluding VAT.

This means that an amount of R412 800 (present value) escalated at 8% per annum, i.e. a nominal amount of approximately R560 000 excluding VAT would be required **in 2010** for

the next major resurfacing. As price projections are notoriously inaccurate and in order to be prudent, we have rounded off this number to **R800 000** excluding VAT for budget purposes.

The HOA would therefore have to collect an extra R200 000 per annum in levies in 2007, 2008, 2009 and 2010 to be able to fund the said expenditure. The 2006 AGM resolved to establish a Road Capex Reserve Fund for this purpose, commencing with a contribution by members of R200 000 in 2007.

▪ **Regular Monthly Road Maintenance Program by HOA**

Equipment / vehicle, gravel etc, or subcontract Arthur Cloete and his team to perform certain duties one week per month: say R50 000 for 2007.

▪ **Regular annual grading and other maintenance work by contractor upon request**

Say R60 000 for 2007.

▪ **MVD Mandate**

Say R10 000 for 2007.

The total is therefore R320 000 for 2007, excluding VAT. This will henceforth be an amount appearing in every budget hereafter.

There may be other alternatives in respect of the roads that may have to be investigated, eg the paving or surfacing of parts of the roads with bitumen seals used in combination with graded stone aggregates. The costs and implications for maintenance would have to be researched in depth to establish whether there are any viable and cost effective alternatives.

8. INFRASTRUCTURE (22 December 2008)

Jan Venter reported as follows:

8.1 WATER NETWORK:

8.1.1 DESIGN PRINCIPLES

The design of the water network is based on the following:

- Guidelines of Human Settlement Planning and Design
- Mossel bay Master plan report
- Peak flow factor used to calculate maximum flow conditions = 6
- Water usage per stand -937.6l/day(0.011l/s)
- Minimum water pressure at take off point - 20 m (2 bar)
- Fire water
 - Maximum Flow (Only one fire hydrant in use) - 15 l/s
 - Minimum water pressure at hydrant - 5 – 7 m (0.5 barg)

MPC confirmed that they are in the process of purchasing additional water rights from Vleesbaai Dienste and it will increase the flow to 1000lt per day per house

8.1.2 DESIGN RESULTS

- Design of the existing and new water hydrants was carried out by professional engineers – MVD Eastern Cape
- MVD will prepare a layout drawing with the calculated pressure at each stand take off point.
- The new stands plus 16 of the existing stands will be provided with water from a new reservoir and new feeder pipeline to ensure adequate water pressure
- The 17 new stands plus 21 existing stands will be provided with a 40 mm diameter house connection to ensure adequate pressure.

8.2 ROADS:

◆ WORK CARRIED OUT IN 2007

- May – August 2007 (Springerbaai Account)
 - ◆ Grading of access road from the entrance gate to the parking area in phase 5
 - ◆ Importing gravel to rebuild base layer where required
 - ◆ Opening up of drainage trenches
 - ◆ Construction of additional berms to ensure adequate drainage of the roads and regulate the speed.
 - ◆ Construction of a 20m long sand seal test section.
- November / December 2007 (Developer's account)
 - ◆ Re-grade and reinstatement of the access road up to the phase 1 turn off
 - ◆ New access road built to phase 4 and access roads to the 17 additional stands.

◆ RATIONALE BEHIND CONSTRUCTION OF SPEEDBUMPS IN ROADS

- Factors influencing performance of gravel roads
 - ◆ Storm water management
 - ◆ Speed of vehicles
 - ◆ Tyre pressures
 - ◆ Road worthiness of vehicles using the roads
 - ◆ Vehicle acceleration and deceleration

(a) STORM WATER MANAGEMENT

- ◆ Current measures in place
 - Driffies
 - Speed humps
- ◆ Methodology
 - Divert storm water from road surface in regular intervals in order to:
 - ◆ Prevent concentration of storm water
 - ◆ Prevent high velocity run offs
 - ◆ Therefore preventing erosion of road
- ◆ Appearance of storm water speed humps
 - Need to be high enough to prevent the water from flowing over, i.e., the steeper the incline the higher the speed hump. Also require more at steeper inclines.
 - At each speed hump an outlet needs to be constructed to enable the run off to be diverted away from the road. These run offs need regular maintenance to be kept clean.

(b) VEHICLE SPEED

- Safety of road users paramount, especially children
- Need to discourage drivers from excessive acceleration and deceleration.
- Need to reduce speed where roads turn
- Current traffic calming devices in place
 - ◆ Speed humps (Physical barrier to force drivers to slow down)
 - ◆ Reduced sight distance (Physiological influence to reduce speed)
 - ◆ Turn radius of road (Physiological influence to reduce speed)
- Experience at Springerbaai and rest of the world, indicates that physiological influences to reduce speed are not effective. Physical humps are therefore required.
- Three vehicles have to date overturned on the internal roads
- Speed hump design:
 - ◆ A new speed hump of about three metres long was proposed by MVD (an example was constructed on the access road to phase 4) which will be implemented during next year at slightly higher cost.
 - ◆ Impossible to design a speed hump so that a vehicle can comfortably pass over at 40 Km/hour. Vehicles need to slow down when a speed hump is to be negotiated.

◆ MAINTENANCE PLAN

- Regular maintenance prevents expensive re-building of roads
- Two types of maintenance required:
 - ◆ Day to day repairs
 - ◆ Annual maintenance to reinstate the condition of the roads

(a) DAY TO DAY MAINTENANCE

- ◆ Day to day repairs of potholes and erosion to be done by Talitha and her team. MVD Consulting Engineers had a training session with them to teach them how to carry out the work. The work generally consists of the following:
 - ◆ Regular inspection of the roads, especially after rain
 - ◆ Repair of potholes as soon as they develop
 - ◆ Maintaining storm water outlets to ensure that water can be drained from the roads
 - ◆ Weed control to prevent weed growth in the road surface, as this leads to water ingress into the structural layers of the road.
 - ◆ Repair of erosion at driffies, and speed humps as a result of wheel spinning.

(b) ANNUAL MAINTENANCE

- ◆ Annual maintenance generally consists of the following:
 - ◆ Grading of the roads
 - ◆ Importation of gravel where required
 - ◆ Construction of Driffies and speed humps

Due to budget constraints the internal road network has been divided as follows:

- ◆ Main access road
 - Entrance up to phase 1 split

- Northern bypass road up to the parking area in phase 5
- ◆ Phase 1
- ◆ Phase 2 and phase 6
- ◆ Phase 3
- ◆ Phase 4
- ◆ Phase 5

Main Access road

The following to be carried out twice per year (End March and November)

- ◆ Grading and compaction
- ◆ Cleaning of drifties
- ◆ Build speed humps

Phase 1 – 6

The following to be carried out on a rotation basis, i.e., each phase will receive maintenance work once every 5 years

- Grading and compaction
- Cleaning of Drifties
- Build speed humps
- ◆ Phase 1 – 2008
- ◆ Phase 2 and 6 – 2009
- ◆ Phase 3 - 2010
- ◆ Phase 4 - 2011
- ◆ Phase 5 - 2012

◆ **SAND SEAL OF STEEP INCLINES**

- The sealing of steep inclines may be carried out depending on budget constraints.
- The work will be prioritized as follows, on the main access roads:
 - ◆ Steep incline at Construction camp
 - ◆ Steep incline to parking area at phase 5
 - ◆ Steep incline just after the gate house
 - ◆ Steep incline at Blue Crane vlei

◆ **ANNUAL MAINTENANCE CONTRACT**

- A maintenance contract was negotiated with Marracon Construction.
- The contract is based on the 2007 rates with 8% escalation per year for the following 5 years.

Reservoir

Water

Certificate by independent consulting engineer re :

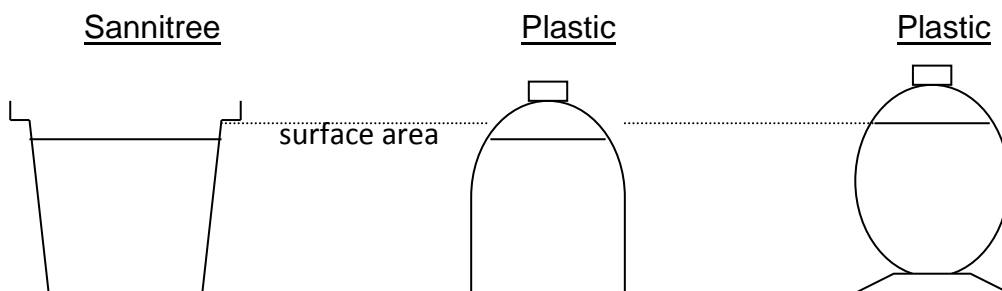
- sufficiency of water rights for existing and 17 additional erven;
- water pressure, and that 17 additional erven will not detrimentally affect pressure to existing erven.

Sanitree sewage system

Advantages of the Sannitree Septic Tank System

1.1 The tank is designed to allow maximum surface area so that bacteria have a large area of space in which to reproduce.

1.2 Profile of surfaces



2. The unit has robust slotted vanes which do not collapse when the solid load builds up. They also allow 3 compartments for decomposition and settling of sludge.
3. The unit can be desludged without collapsing the sides or the plumbing. This has occurred with some plastic tanks.
4. The unit is designed to allow easy maintenance of the Bio-Filter which is fitted immediately below the manhole.
5. The smooth interior finish allows for easy desludging.

6. The re-inforced lid consists of 5 pieces which dovetail together and make provision for two manholes. This makes for easy cleaning if necessary. It also allows the tank to be buried or driven over.

7. The 110mm entry and exit holes may be put in after installation, allowing the plumber to adjust to the fall of the pipe without using unnecessary bends. These items 10.5, 10.6, 10.6.1 are to be sealed by a specially made rubber grommet.

8. Sannitree tanks have been on the market since 1986 and carry a 10 year warrantee

Gatehouse

Gatehouse maintenance approved for repainting in 2007 and re-seal of tiles inside and outside at gatehouse.