GAMKABERG NATURE RESERVE

ROADS CONDITION ASSESSMENT - STORM DAMAGED ROADS

S33º40'15.53" – E21º53'20.25"

PROJECT REF NO: EM-GI000103 (DOI), 11755010 (V3)

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REPORT DESCRIPTION	CONDITION ASSESSMENT AND RECOMMENDATIONS

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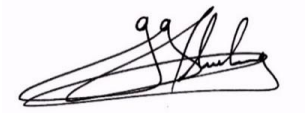
Author's signature(s) 

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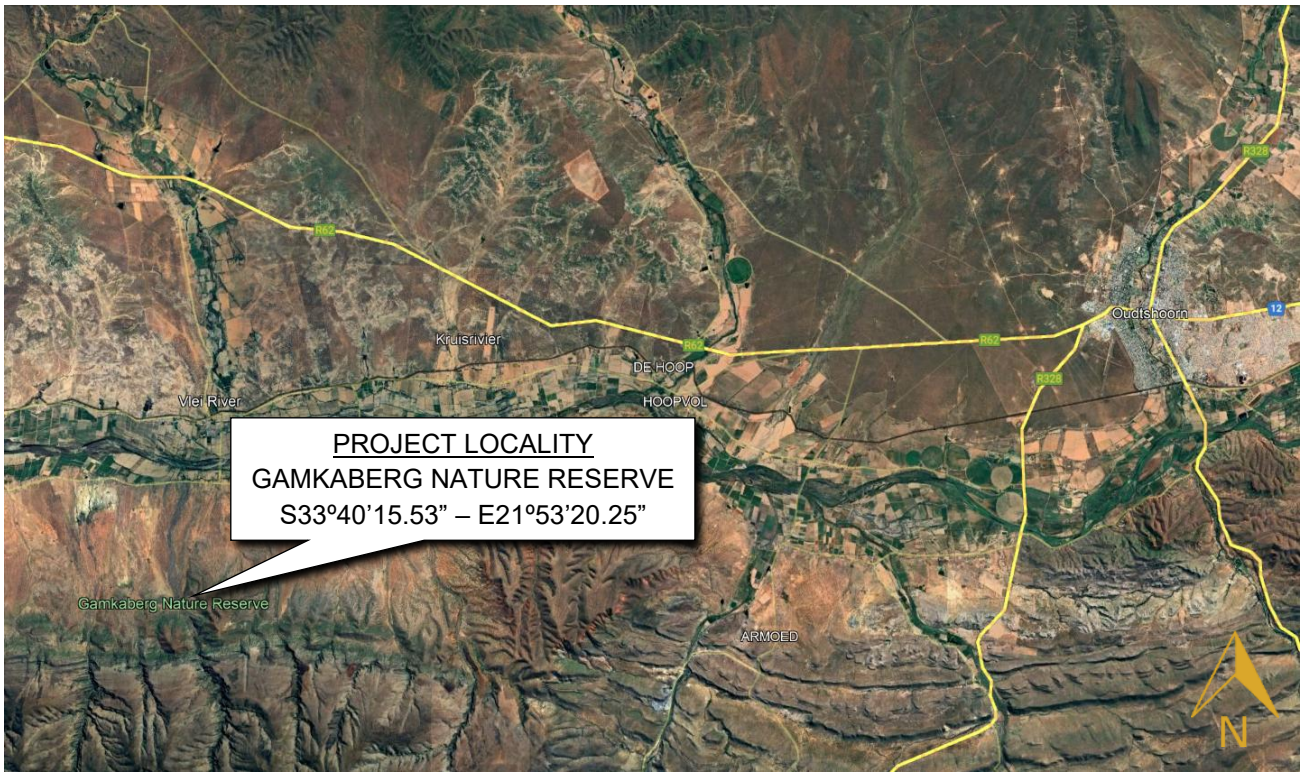

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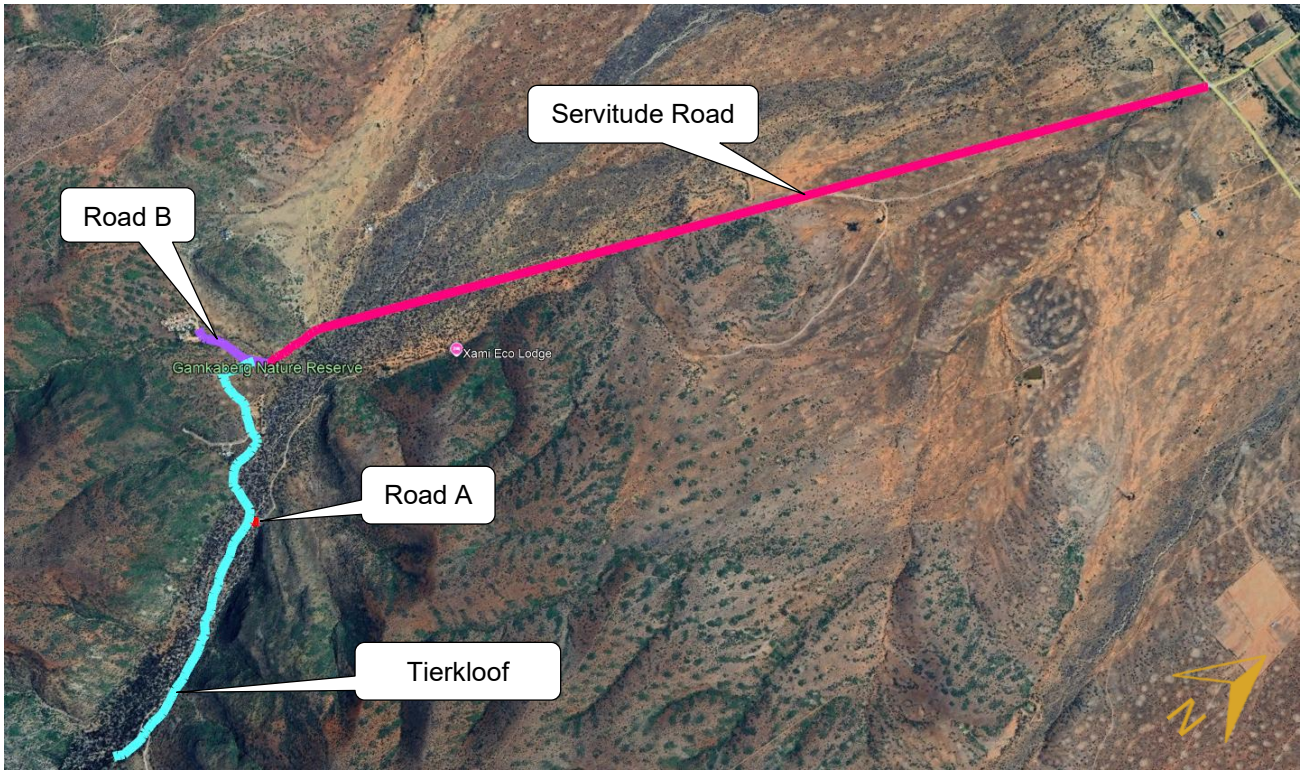

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LOCALITY PLAN

CONDITION ASSESSMENT
GAMKABERG MANAGEMENT ROADS

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1. INTRODUCTION

V3 Consulting Engineers (Pty) Ltd. was appointed by the Western Cape Government Department of Infrastructure to conduct disaster damage condition assessments for 22 of CapeNature reserves in the Western Cape and provide a report on current conditions and any recommended remedial works deemed necessary. This report is for the Gamkaberg Nature Reserve situated 33km south-west of Oudtshoorn and 32km south-east of Calitzdorp in the Western Cape as shown on the Locality plan, Figure 1. The reserve forms part of the 80 000ha Gamkaberg Conservation Area which is made up of various categories of protected areas.

This assessment was conducted in response to widespread infrastructure damage caused by the 2024 storm events across the province. The severity and extent of the damage prompted concern from CapeNature regarding the structural integrity, accessibility, and operational functionality of several nature reserves under its management. The assessment confirmed that various critical infrastructure components sustained significant damage, which has had a detrimental effect on tourism activity and has disrupted the operations of businesses reliant on ecotourism within these reserves. These include the following:

- Tierkloof road
- Servitude Road
- Road B (access to the employee's residences)

A site visit was conducted on the 10th of June 2025 to assess the current condition of the impacted infrastructure and to explore potential remedial actions were necessary. Present during the assessment were three (3) team members from V3 Consulting Engineers, two (2) representatives from Gamkaberg CapeNature Reserve and two (2) from the Department of Infrastructure. (refer to Attendance Register – Annexure B).

1.1 PROJECT SCOPE / BRIEF

The scope of work for this reserve entails the following:

- Site inspection to confirm current conditions of storm damaged roads at Gamkaberg Nature Reserve.
- Report on findings and provide recommendations on any necessary remedial works
- Estimate the quantities of the remedial works and provide estimates for the cost of the remedial works
- Conduct site inspections during the remedial works.

1.2 BASIS OF INFORMATION

The road condition assessment is based on visual inspections conducted on site to evaluate and document all storm-damaged roads within the reserve. It should be noted that no drawings or as-built information was provided to the V3 team, and no tests were carried out. All the provided measurements and quantities are to be taken as approximate.

Once on site, the team conducted a comprehensive condition assessment of the roads, took measurements of damaged areas and had discussions with both the CapeNature and Department of Infrastructure teams on possible and most suitable solutions to consider for the site. Previous remedial efforts were noted, and their effectiveness was considered. Upon completion of the site condition assessment, the V3 team explored different options for the remedial actions to find out which would be feasible considering the access and mobility constraints on site. With these restraints in mind, a preliminary construction plan was considered for the site and all remedials

works were based on this plan or its variation thereof. As previously mentioned, all quantities and measurements are to be taken as approximate. The final quantities are to be determined on site.

2. SITE DESCRIPTION

2.1 CAPENATURE – GAMKABERG NATURE RESERVE

Site name:	CapeNature – Gamkaberg Nature Reserve
Location:	S33º40'15.53" – E21º53'20.25
Management Road Assessments:	1. Tierkloof road (1.8 km) 2. Servitude road (3.8 km) 3. Road B (0.03 m)

Gamkaberg Nature Reserve serves as a vital ecological sanctuary. The reserve features rugged terrain, including rocky plateaus, deep ravines, and sandstone cliffs, offering sweeping views over the Klein Karoo. The reserve is also recognized for its commitment to sustainable ecotourism. Facilities include eco-lodges, wheelchair-accessible accommodations, interpretive hiking trails, and 4×4 routes.

2.2 FINDINGS SUMMARY

2.2.1 Tierkloof Road (1.8 km)

The general condition of the road ranges from good to critical. There are sections that exhibits natural firmness, have been rehabilitated, are in moderate condition and, the road indicating good grading. Nevertheless, poor stormwater management is the disastrous issue to the road's stability and structural integrity. It is the main factor that induces severe soil erosion and structural failure. There are multiple areas within the road that have reached their critical thresholds due to seasonal watercourses intersecting the road at different sections. Although gabion mattresses are installed, some have corroded mesh, and need extension to direct the surface runoff. The road edges at these critical sections are strewn with boulders, cobbles, and sediment, indicating high-energy water flow capable of transporting large debris. This poses risk to road stability, safety, and erosion control. high volumes of surface runoff, inadequate stormwater management infrastructure.

2.2.2 Servitude Road (3.8 km)

The road condition ranges from good, average to critical. The road has compacted soil surface exhibiting signs of moderate to severe wear. ruts formed along the road. These ruts have been exacerbated by recent rainfall, resulting in muddy, saturated conditions. Soil erosion is evident, the road shows clear signs of water-induced degradation, with multiple longitudinal ruts formed along the road. These ruts have been exacerbated by recent rainfall, resulting in muddy, saturated conditions and the presence of standing water in depressions. The road has inadequate stormwater drainage infrastructure. There are multiple seasonal watercourse areas intersecting the road. The road edges are strewn with boulders, cobbles, and sediment, indicating high-energy water flow capable of transporting large debris in these sections. This pose risks to road stability, safety, and erosion control.

2.2.3 Road B (0.03 km)

During periods of intense rainfall, the narrow access road leading to the workers' accommodation becomes completely inundated, turning into a fast-moving stream of muddy water. Poor drainage and the low-lying terrain mean that water quickly accumulates, submerging the entire stretch and making it impassable for vehicles and unsafe for pedestrians. The road, which normally connects the accommodation to the office, effectively cuts off all transit in and out of the area. As a result, employees are often stranded. Either unable to reach their accommodation after work or stuck inside and unable to report for duty. This disruption not only affects individual schedules but also has wider operational impacts on the reserve's productivity and safety planning.

3. SITE ASSESSMENT

3.1 SITE ASSESSMENT CHECKLISTS AND PHOTOGRAPHS

Each road was assessed using a uniform checklist listing all the elements grouped by function and with details such as size and quantity. A rating system is used to rate the current condition of each element and as guidance to urgency and severity of intervention required. The ratings ranked as follows:

	1- Excellent: No intervention required now. Element should function as intended for another 2-3 years
	2- Good: Element still functioning as intended, but plan for maintenance within the next 1-2 years.
	3- Average: Element in fair condition with no immediate risk but is recommended to be addressed within a year
	4- Poor: Element poses a risk / is at risk and remedial action to be taken as soon as possible.
	5- Critical: Element poses a serious safety / functionality risk and should be barred off / not used at all

Each road has been assessed and reported on individually. For a detailed breakdown of individual observations and descriptions, refer to the condition assessment attached as Annexure A.

Table 1: Conditional assessment photos

Tierkloof road		
 Figure 3: photo 5, gravel road in moderate condition with slightly eroded edges and inadequate drainage.	 Figure 4: photo 12, seasonal watercourse intersecting the road. No adequate drainage to manage the stormwater.	 Figure 5: photo13, seasonal watercourse intersecting the road. No adequate drainage to manage the stormwater
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Tierkloof *(continued)*

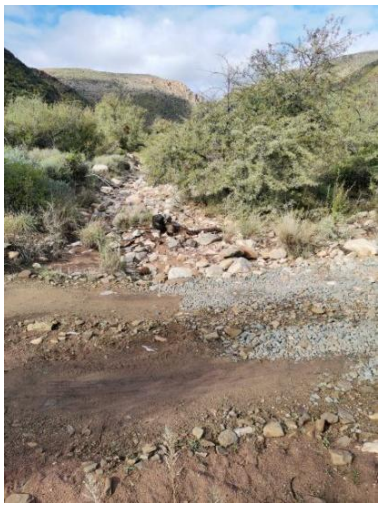

Figure 9: photo 28, a seasonal watercourse area intersecting the road. The road edge is strewn with boulders, cobbles, and sediment.

Figure 10: photo 29, there's a seasonal watercourse intersecting the road. The road edge is strewn with boulders, cobbles, and sediment. There are concrete stormwater pipes.

Figure 11: photo 35, The road exhibits natural firmness and is in moderate condition.

Servitude road

Figure 12: photo 40 a watercourse area with boulders, cobbles and debris.

Figure 13: photo 43, filled watercourse culverts needed.

Figure 14: photo 51, watercourse area with gabion mattresses.

Servitude road *(continued)*

Figure 15: photo 53, watercourse area, with gabion mattresses.

Figure 16: photo, 56 The road exhibits natural firmness and is in moderate condition.

Figure 17: photo 59, muddy, saturated conditions. And standing water in depressions.

Figure 18: photo 67, The road exhibits natural firmness and is in moderate condition.

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Figure 21: photo 72, the road exhibits natural firmness and is in moderate condition.

Figure 22: photo 3, The watercourse that was backfilled after the last rain.

Figure 23: photo 4, a watercourse high volume surface runoff zone.

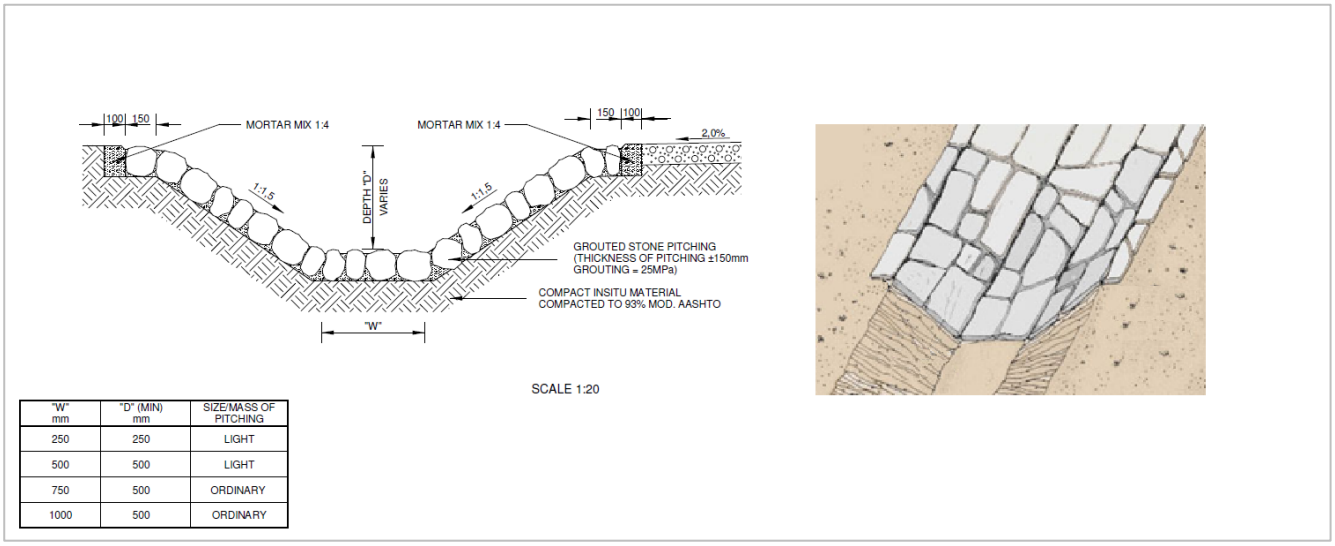
Servitude road	Road B

4. RECOMMENDATIONS

4.1 REPAIR WORKS SPECIFICATIONS

4.1.1 Hand-laid Stone Pitching

Hand-laid stone pitching involves preparing the area, then placing stones individually, often with mortar, to create a stable, erosion-resistant surface. This technique is commonly used for lining open drains, protecting slopes, and constructing retaining walls.



"W" mm	"D" (MIN) mm	SIZE/MASS OF PITCHING
250	250	LIGHT
500	500	LIGHT
750	500	ORDINARY
1000	500	ORDINARY

Figure 24: Hand-laid Stone Pitching

Use stones for hand-laid pitching in the following areas:

- Natural watercourses to remedy erosion.
- Areas adjacent to roads where there are signs of washout or undermining.

Table 2: Approximate length of stone pitching to be constructed

Management Road Assessments	Length(m)
Tierkloof	N/A
Servitude	N/A
Road B	N/A

Stones must be:

- Tightly interlocked.
- Embedded slightly below grade to prevent displacement.

4.1.2. Rolling Dips/Water Bars

Rolling dips collect surface runoff and direct it across and away from the roadway or trail, minimizing erosion.

- Construct using:
    - Imported gravel humps, placed at an angled alignment to divert water gently off the road surface.

Table 3: Approximate number of 3m long Rolling Dips to be constructed

Management Road Assessments	Number of Gravel (No)	Number of Concrete (No)
Tierkloof	36	N/A
Servitude	75	N/A
Road B	3	N/A

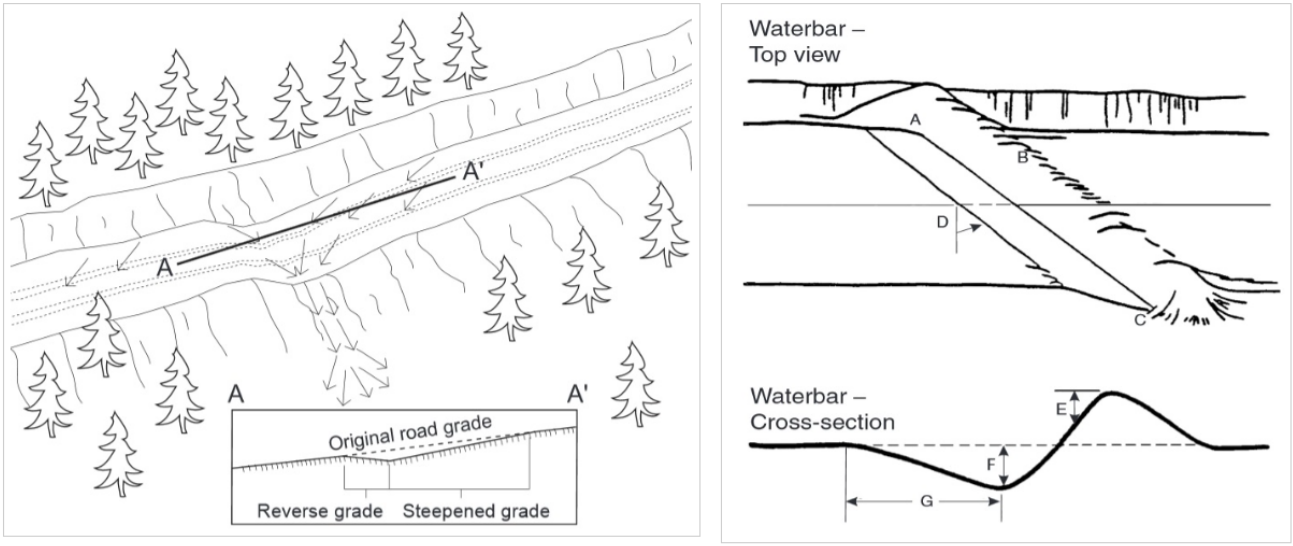


Figure 25: Rolling Dips/Water Bars

4.1.3. Concrete Access Strips

Concrete access strips are often constructed to provide basic, low-maintenance vehicle access over erodible, steep, or wet terrain. While there is no single national standard document specific to rural 4x4 access strips, they are usually designed using principles from the following references:

4.1.3.1. Reference Standards & Guidelines:

1. South African National Standards (SANS):
   - SANS 1200 G: Concrete (Structural)
   - SANS 10100-1: The structural use of concrete – Part 1: Design
   - SANS 10100-2: The structural use of concrete – Part 2: Materials and execution of work
2. TMH 1: Standard Methods of Testing Road Construction Materials – CSIR
3. COLTO (Committee of Land Transport Officials) Standard Specifications
4. SANRAL Standard Drawings (particularly rural road and low-volume roads manual

Table 4: Typical Specifications for Concrete Access Strips

Item	Specification
Strip Width	600 mm to 800 mm per wheel path
Gap Between Strips	600 mm to 1000 mm (depending on wheel track width)
Strip Length per Panel	2.0 m (Cast Alternatively with Expansion joints every 10m)
Concrete Class	25 MPa at 28 days (Class 25/19)
Aggregate Size	Max 19 mm (Standard)
Strip Thickness	150 mm for standard access (light vehicles); increase to 175–200 mm for heavier 4x4s or steep gradients
Base Layer	150 mm G5 or G6 compacted to 95% Mod AASHTO (as per SANS 1200DM)
Subgrade	Minimum CBR of 8%, otherwise subgrade improvement required
Jointing	Cast in alternate 2 m sections to allow for shrinkage cracking (construction joints every 2 m). Provide a 15 mm wide expansion joint at every 10 m interval and at all interfaces with fixed structures. Fill joint with bitumen-impregnated fiberboard to full slab depth (150 mm). Seal with flexible mastic if desired to prevent debris ingress.
Surface Finish	Light broom finish for traction
Edge Restraint	Optional – may include edge thickening or shallow side drains for drainage control
Reinforcement	Typically unreinforced for cost, but can include light mesh (A142) if needed for durability or in steep terrain

4.1.3.2. Drainage Considerations:

- Lateral fall or crown to prevent water ponding.
- Provide mitre drains or side ditches at regular intervals.
- Cross-fall of ~3% is typical to ensure runoff.

4.1.3.3. Construction Notes:

- Cast alternate slabs to prevent thermal cracking.
- Cure with plastic sheeting or curing compound for at least 7 days.
- Compact sub-base and base thoroughly to reduce future movement.
- Concrete must be vibrated or well-compacted to reduce voids.

Table 5: Approximate length of concrete strips to be constructed

Management Road Assessments	Length (m)
Tierkloof	N/A
Servitude	N/A
Road A	N/A

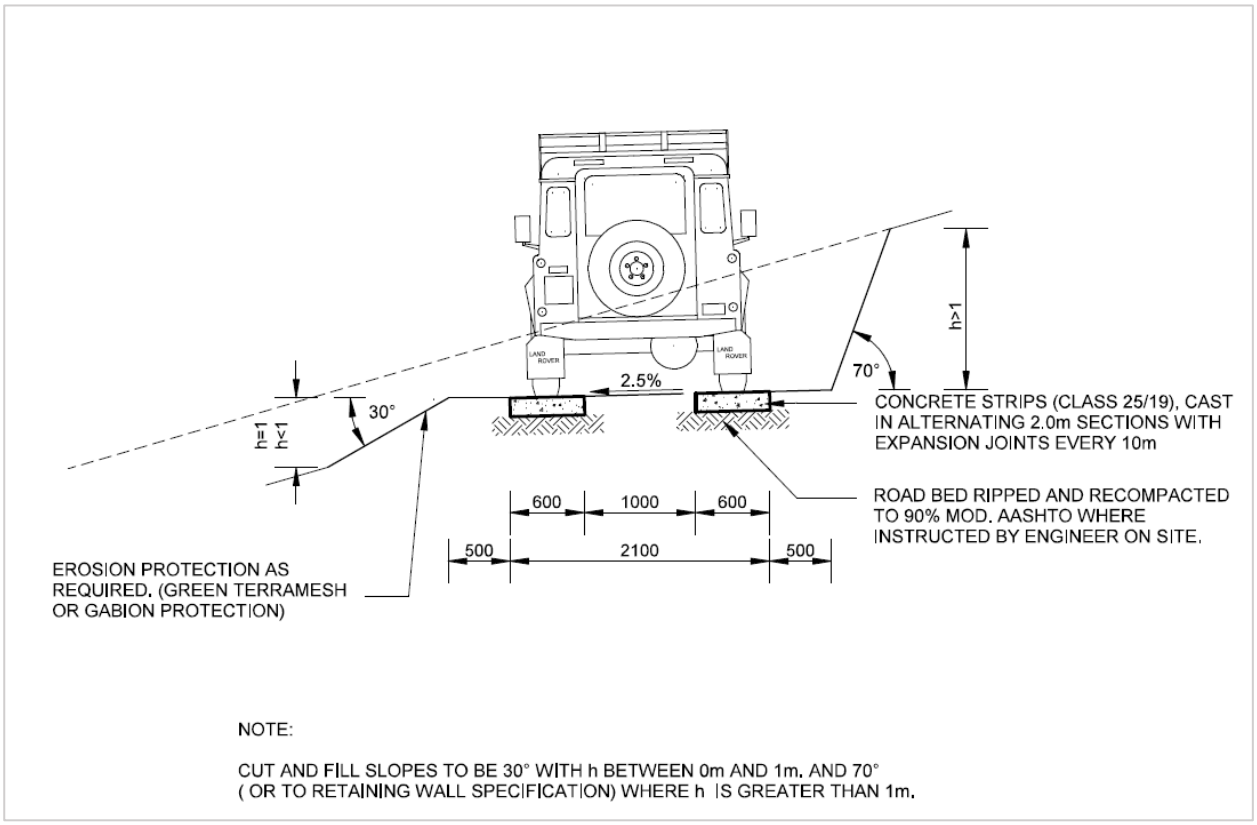


Figure 26: Typical Cross-Section of Concrete Access Strip

4.1.4. Low Level Crossing

Low-level crossings are designed to provide vehicular access over intermittent or seasonal watercourses where high-level bridges are not economically feasible.

Culverts can optionally be incorporated into the low-level crossing to facilitate the controlled passage of water during low to moderate flow conditions. This reduces the risk of erosion and surface washouts, enhances road safety, and prolongs the service life of the crossing. The provision and installation of culverts are dependent on the accessibility of the site for transporting construction materials. In areas with difficult or steep terrain, the delivery of precast elements may not be feasible. In such cases, alternative solutions or omitting culverts may be considered based on practical constructability and environmental conditions.

4.1.4.1. Culvert Specification

- Type: Precast concrete box culvert
- Dimensions: 600 mm wide x 600 mm high
- Quantity: Optional based on site-specific hydrological assessment
- Placement: Transverse to the road, below the low-level slab or gravel surface
- Inlet/Outlet Protection: Rock pitching or Reno® Mattresses are recommended to prevent scour.

These culverts are suitable for rural and low-traffic volume routes where the watercourse experiences occasional flows. The size (600 x 600 mm) is effective for small catchments or where flow is shallow and dispersed. In larger or fast-flowing watercourses, additional culverts or alternative hydraulic structures may be required.

4.1.4.2. Maintenance and Monitoring

Regular inspection and removal of debris are essential to maintain flow capacity. Blockages can lead to overtopping and potential damage to the crossing.

4.1.4.3. Summary

The optional use of 600 x 600 mm culverts in low-level crossings provides a practical and cost-effective solution for managing intermittent water flows. However, implementation is subject to the ability to transport and install culvert units in challenging terrain. Final culvert numbers and placements should be determined through a site-specific assessment, considering hydrology, constructability, and logistical constraints.

Table 6: Approximate number of low-level crossings to be constructed

Management Road Assessments	Number (No)
Tierkloof	3
Servitude	4
Road B	1

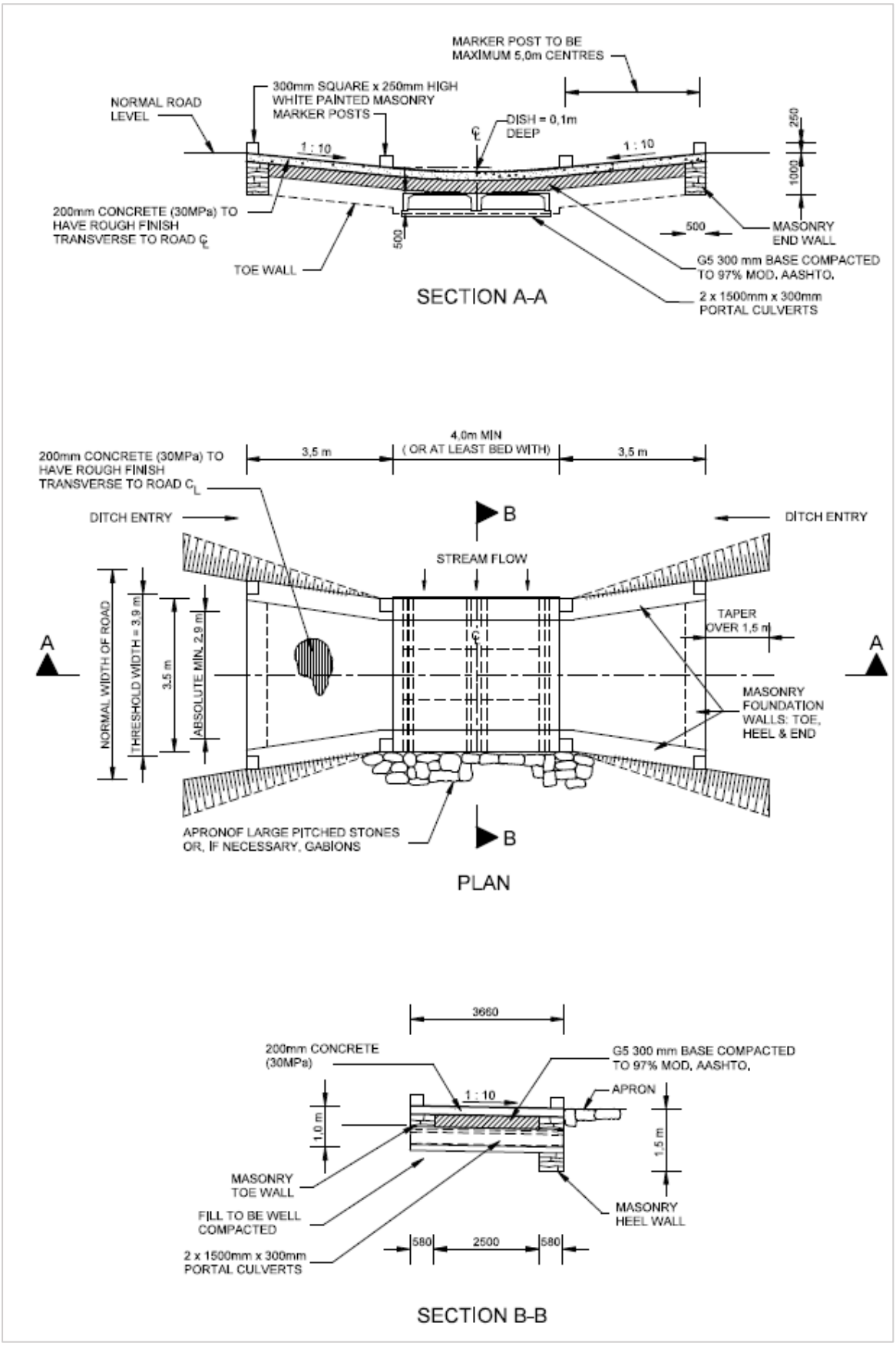


Figure 27: Typical Low-Level Crossing

4.1.5. Concrete Drifts

Concrete drifts are low-water crossings constructed to allow the safe and reliable passage of vehicles over intermittent or low-flow watercourses. In rural areas with two-track maintenance access roads, these drifts serve as cost-effective and low-maintenance alternatives to conventional bridges, particularly in terrains where watercourses cross frequently and where stormwater flow is seasonal.

The primary function of concrete drifts is to facilitate vehicle access during dry conditions while withstanding occasional submersion during floods. For rural two-track maintenance access roads, especially in undeveloped or mountainous areas, they improve accessibility without significantly altering the natural drainage system.

Concrete drifts are especially suitable for rugged terrain where the construction of culverts or bridges is constrained by cost, limited access to heavy machinery, or environmental sensitivity. Their low profile minimizes visual and ecological impact while maintaining essential connectivity for maintenance purposes.

4.1.5.1. Drift Design Considerations

- Concrete Strength: Concrete Class 25/19 is commonly used, offering sufficient durability against abrasion and water exposure.
- Foundation: Drifts are cast in-situ on a compacted sub-base or rock bed to prevent undermining and ensure structural stability.
- Hydraulic Capacity: The structure is designed to be overtopped by floodwater.
- Surface Texture: A broom or brush finish is applied to enhance traction for maintenance vehicles.
- Approach Protection: Gabions and Reno® Mattresses may be included upstream and downstream to reduce erosion at entry and exit points.

Table 7: Approximate number of concrete drifts to be constructed

Management Road Assessments	Number (No)
Tierkloof	2
Servitude	2
Road B	1

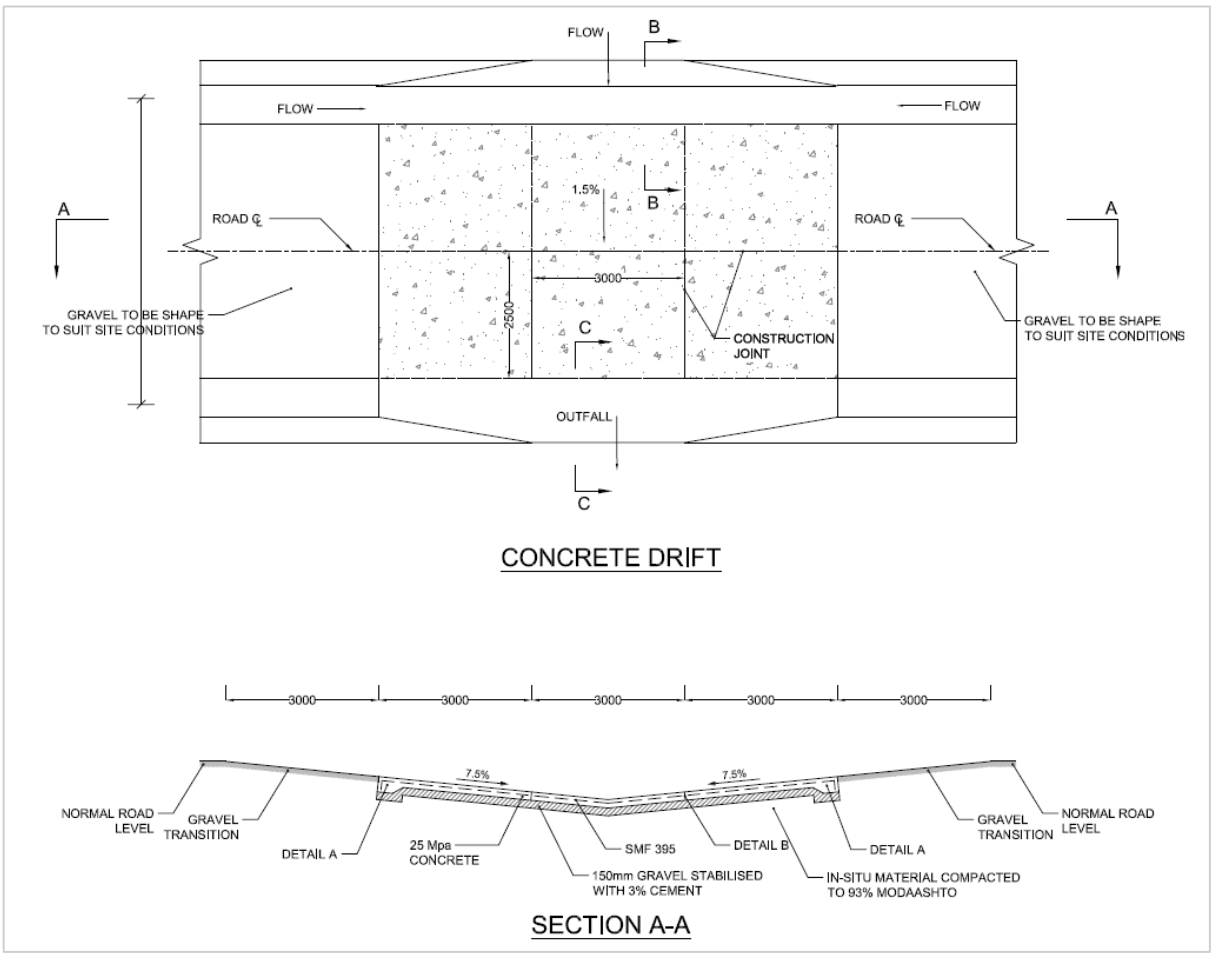


Figure 28: Typical Concrete Drift

Note: Image sourced from https://www.sanparks.org/wp-content/uploads/2021/09/concrete-drift-drawing.pdf

4.1.6. Gabion Wall for Erosion Protection on Steep Slopes

Two-track maintenance access roads traversing steep terrain are particularly susceptible to surface runoff and erosion, which can undermine road stability and cause washaways. In areas where terrain conditions limit the use of conventional stormwater drainage or retaining structures, gabion walls serve as a cost-effective, durable, and locally adaptable erosion protection solution.

Gabion walls are used to:

- Stabilize the toe of steep embankments and cut slopes.
- Prevent soil erosion and retain fill or natural slope material.
- Protect road shoulders and maintain track width and integrity.

4.1.6.1. Design Considerations

- Height: Gabion walls should typically not exceed 3.0 m in height without stepped terraces or additional geotechnical design.
- Batter: A stepped or battered configuration (e.g., 6V:1H) increases stability.
- Foundation: Compact and level foundation with possible use of filter fabric to prevent soil migration.
- Drainage: Adequate weep holes or granular backfill should be provided to relieve hydrostatic pressure.
- Materials: Galvanized or PVC-coated wire baskets filled with well-graded angular rock (preferably 100–200 mm in size).

4.1.6.2. Construction Notes

- Use local rock fill where available to reduce costs and logistics.
- Layer baskets tightly and securely with staggered joints.
- Install from the lowest elevation upward.
- Vegetation can be introduced for additional surface stabilization.

4.1.6.3. Typical Applications

- Downslope protection on outer edges of mountain tracks.
- Retaining material on inside bends of tight curves with cut slopes.
- Intermittent check structures in erosive gullies adjacent to the road.

4.1.6.4. Maintenance

Annual inspection for settlement, wire corrosion, or dislodged rock is essential, especially after heavy rainfall events. Repair or replacement of damaged baskets should be prioritized to prevent further slope degradation.

Table 8: Approximate square metres of Gabion retaining walls to be constructed

Management Road Assessments	Area (m²)
Tierkloof	86 m²
Servitude	150 m²
Road A	30 m²

Figure 29: Typical Gabion Wall for Erosion Protection on Steep Slopes.

Note: Image sourced from https://www.geotech.hr/en/gabion-walls/

5. GENERAL

The Contractor shall note that the site is within a popular tourist amenity. The Contractor shall comply with all CapeNature, Western Cape Governments and Local Authority regulations including those relating to health, the environment and fire. The Contractor shall ensure that all camp facilities, including those for fueling, comply with all such regulations.

Should the contract include either the Easter weekend and / or the end of year builders' holidays the camp shall be dis-established in its entirety prior to such periods and re-established at the end of such periods.

The Contractor shall provide sufficient latrine facilities for its workers as required by local regulations and these shall be in proximity to the work area.

The following is to be noted when works are undertaken at Cape Nature Reserves:

- **Reinstatement of services and structures damaged during construction**

The Contractor shall inform the Employer's Agent immediately when a service or structure is damaged. The extent of the damage and a proposal on how to reinstate the service or structure shall be submitted to the Employer's Agent on a sketch with dimensions and time frames.

The Contractor shall not be allowed to reinstate any service or structure unless indicated so by the Employer's Agent. The Contractor shall render all reasonable assistance to the service or structure owner with the reinstatement of the service or the structure if required.

The Contractor shall be liable to reinstate the service or structure to its original state or for the full cost thereof if reinstated by others.

- **Water and Power Supply**

The Contractor shall make their arrangements for water supply, and the cost, if any, will be for the Contractor's account.

The Contractor shall make his arrangements for the supply of electricity that he may require for the execution of the works and the costs of any connections, additional reticulation and the supply of electricity shall be borne by the Contractor.

- **Waste Disposal**

The Contractor shall make their arrangements for solid and liquid waste disposal off-site. No disposal of any waste will be permitted within the nature reserve.

- **Ablution Facilities**

Ablution facilities are not available on site. The Contractor shall therefore make the necessary arrangements to provide these facilities.

- **Dealing with high winds**

The site is situated in a region where high winds and seasonal rain can be expected. Strong winds occur during the summer and winter months, and rain occurs during the winter.

All heaps of materials, either forming part of the excavations or imported for use in construction, shall be kept covered during high winds to prevent contamination of surrounding vegetation

- **Excavation**

All excavations shall be carried out with suitable equipment operating strictly within the work area as defined above. Any excavation by mechanical means shall be carried out by mechanical equipment operating from the existing road surface within the demarcated work area. All excavation shall be carried

out such that no damage to the environment, including flora and fauna, shall occur and that the natural vegetation surrounding the working areas is not affected in any way.

Material from excavations required for backfilling may be stockpiled outside the demarcated work area on the existing road but shall be stockpiled strictly on the surface and shall not be allowed to encroach onto the shoulders or onto vegetation abutting the road. If this requirement is not strictly adhered to, the Contractor shall not be allowed to stockpile material on the road but shall stockpile material at locations directed by the Employer's Agent. No compensation for any additional expense that may be incurred in this regard shall be paid.

7 PROJECT BUDGET

7.1 PROVISIONAL BUDGET – PROJECT INCEPTION

Provisional budget for the project by the Department is as follows:

Servitude road	R 3 600 000.00
Tierkloof to office	Covered above
Road A & B	Not in the budget

The consultant team was tasked to determine a provisional budget during the combined Stages 1 and 2 scope assessment and determination by compiling an elemental estimate of all works and items deemed to be included in the project scope of work.

Upon review of the combined Stages 1 and 2 reports, the Department of infrastructure is to indicate which items are to be included or not, and a provisional project budget will be established to secure funding. The final project budget will be refined during Stage 3.

7.2 PROVISIONAL BUDGET – CURRENT ELEMENTAL ESTIMATE COST

7.2.1 Cost consultant

V3 Consulting Engineers will be the approved Cost Consultant from the WCG DOI consultant framework to assist with the high-level cost estimates for all civil related work. The estimated budget is based on a priced provisional bill of quantities method with rates taken from the Framework BOQ prices of 2025/2026 as supplied by DOI. The estimate will consider the following assumptions:

- Value Added Tax at 15%.
- Normal working hours. No overtime or night shifts factored in.
- Professional fees allowed at 10%, including additional PSPs, Land Surveyor, Arborist, AIAA and OHS.
- Contingency allowance of 10%.
- Disbursements allowance of 5%.
- Escalation-based BER BCI Pre-tender (December 2023 to October 2024)
- CPAP allowance: HAYLETT: Post Contract - construction stage - (October 2024 to June 2025)
- Construction assumed to start third quarter of 2025 with an 8-month construction period.

Refer to cost estimates data table below

7.2.2 Cost estimates data table

Section	Construction cost	Priority 1 (Critical)	Priority 2 (Poor)	Priority 3 (Average)	Priority 4 (Good)	Priority 5 (Excellent)
1. Tierkloof (tourist road)	R 1,023,766.58	R 639,797.05			R 42,714.00	
2. Servitude (tourist road)	R 5,689,624.58	R 2,189,139.05		R 1,603,944.00		
3. Road B (Employees accomodation road)	R 351,718.80	R 234,479.20				
Estimated current Construction cost excl. P & G, Fees, Escalation & VAT	**R 7,065,109.95**	**R 3,063,415.30**	**R -**	**R 1,603,944.00**	**R 42,714.00**	**R -**
Preliminary and General (40%)	R 2,826,043.98	R 1,225,366.12	R -	R 641,577.60	R 17,085.60	R -
Subtotal	**R 9,891,153.93**	**R 4,288,781.42**	**R -**	**R 2,245,521.60**	**R 59,799.60**	**R -**
Contingency (10%)	R 989,115.39	R 428,878.14	R -	R 224,552.16	R 5,979.96	R -
Estimated current cost excl. Fees & VAT	**R 10,880,269.32**	**R 4,717,659.56**	**R -**	**R 2,470,073.76**	**R 65,779.56**	**R -**
Escalation costs (0%)	R -	R -	R -	R -	R -	R -
Estimated final cost excl. Fees & VAT	**R 10,880,269.32**	**R 4,717,659.56**	**R -**	**R 2,470,073.76**	**R 65,779.56**	**R -**
Professional fees (10%)	R 1,088,026.93	R 471,765.96	R -	R 247,007.38	R 6,577.96	R -
Disbursements (5%)	R 544,013.47	R 235,882.98	R -	R 123,503.69	R 3,288.98	R -
Estimated final cost excl. VAT	**R 12,512,309.72**	**R 5,425,308.50**	**R -**	**R 2,840,584.82**	**R 75,646.49**	**R -**
Value Added Tax (15%)	R 1,876,846.46	R 813,796.27	R -	R 426,087.72	R 11,346.97	R -
ESTIMATED FINAL COST ALL INCLUSIVE	**R 14,389,156.18**	**R 6,239,104.77**	**R -**	**R 3,266,672.55**	**R 86,993.47**	**R -**

7.3 SUB-CONSULTANT LIST

Table 9 sub-consultant list

No.	Sub-consultant	Requirement	Procurement
1	Environmentalist	Regulatory requirement	Subconsultant to V3 Consulting Eng.
2	Health and Safety Consultant	Regulatory requirement	From WCG DOI Framework

8 PROJECT SCHEDULE

8.1 PROVISIONAL SCHEDULE

The provisional timeline for the project is summarized as per the ECSA guidelines, stages 1 to 6.

Table 10: Provisional project timeline

Stage No.	Description	Timeline	Comment
1	Inception	25 May 2025 to 25 July 2025	*Stages 1 and 2 combined. **Inclusive of Builder's Break. *Client review and approval period:*
2	Concept and Viability	25 May 2025 to 25 July 2025	
3	Detail Design	28 July 2025 to 05 September 2025	*Client review and approval period:*
4	Document and Procurement	08 September 2025 to 06 October 2025	*Client review, approval, and procurement period:*
5	Construction	06 October 2025 to 27 March 2026	Final estimated construction period to be determined at end of Stage 3. **Inclusive of Builder's Break.
6	Closeout	30 March 2026 to 24 April 2026	All efforts to be made to avoid overall project timeline overrun.

- *Timelines are an estimation and subject to change pending approvals.*

9 CLIENT APPROVAL AND COMMENTS

CLIENT COMMENTS

Name	Designation	Comment

CLIENT APPROVAL

Name		
Designation		
Date		Signature
Name		
Designation		
Date		Signature
Name		
Designation		
Date		Signature

ANNEXURE A

CONDITION ASSESSMENTS – TIERKLOOF TO GAMKABERG OFFICE, SERVITUDE ROAD

V3 CONSULTING ENGINEERS

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PROJECT:	CapeNature Condition Assesment					DATE:	2025-06-10
DESCRIPTION:	Gamkaberg Nature Reserve - Tierkloof to office (1.8km) Road Management						
Photo ID	**Stake Value**	**Distance**	**Priority**	**Description**	**Erosion Control and Drainage Measures**		
5	0	0	2.Good	The Tierkloof gravel road is in moderate condition. The road edges are slightly eroded in some areas, and there is inadequate stormwater drainage infrastructure, which could render the road vulnerable to erosion during an intense rainfall.	Construct angular gravel humps at 50m intervals to facilitate stormwater runoff and prevent soil erosion.		
8	134	134					
7	158	24					
9	176	18					
12	356	180	5.Critical	There is a watercourse intersecting the road. During rainfall, this area experiences surface runoff, which poses risk to road stability, safety, and erosion control. There's existing gabions both the LHS and RHS of the road however, no adequate drainage to manage the stormwater. After every rainstorm the road gets washed away and has to be frequently rehabiliated to provide mobility for the reserve tourists and personnel.	Import G5 gravel material 250mm thickness. Construct in-situ concrete slab: Strength of concrete 30MPa, 5m x 3m x 0.15m thickness. Extend the RHS wingwall using gabions by 5m x 1.2m height.		
11	371	15					
13	407	36					
14	443	36	2.Good	The road exhibits natural firmness and is in moderate condition however, improve the stormwater drainage infrastructure.	Construct angular gravel humps every 50m and reshape existing.		
15	498	55					
16	498	0					
17	700	202	5.Critical	There's a watercourse intersecting the road. The road edge is strewn with boulders, cobbles, and sediment, indicating high-energy water flow capable of transporting large debris. This pose risks to road stability, safety, and erosion control. After every rainstorm the road gets washed away and has to be frequently rehabiliated to provide mobility for the reserve tourists and personnel.	Construct a river crossing with 4 x 600 x 600 culverts, and concrete slab : 12m x 4m width x 0.15m thickness. On both LHS and RHS of the road, construct gabion wingwalls to direct the flow, 10m x 1m.		
23	749	49	2.Good	The road exhibits natural firmness and is in moderate condition, however improve the stormwater drainage infrastructure.	Construct angular gravel humps to facilitate stormwater runoff and prevent soil erosion every 50m.		
24	852	103					
25	852	0					
26	953	101					
27	953	0					
28	987	34	5.Critical	There's a watercourse intersecting the road. The road edge is strewn with boulders, cobbles, and sediment, indicating high-energy water flow capable of transporting large debris. This poses risk to road stability, safety, and erosion control. After periods of heavy rainfall, the road the road becomes difficult to navigate for tourists in low-clearance vehicles.	Install 4 x 600 x 600mm culverts Construct angular gravel humps and gabions on both sides of the road. Construct gabion wingwall 30m long x 1m height		
29	987	0					
31	1029	42	2.Good	The road exhibits natural firmness and is in moderate condition, however improve the stormwater drainage infrastructure.	Construct angular gravel humps every 50m interval and reshape the existing gravel humps.		
32	1029	0					
33	1214	185					
34	1329	115					
35	1329	0					
36	1400	71					
37	1683	283					
38	1800	117					

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PROJECT:	Cape Nature Condition Assesment				DATE:	2025-06-10
DESCRIPTION:	Gamkaberg Nature Reserve - Servitude (3.87km) Road Management					
Photo ID	**Stake Value**	**Distance**	**Priority**	**Description**	**Erosion Control and Drainage Measures**	
38	1800	0	3.Average	Start of Servitude road.	Import G5 gravel material 150mm thickness.	
39	1925	125	3.Critical	There's a watercourse intersecting the road. The road edge is strewn with boulders, cobbles, and sediment, indicating high-energy water flow capable of transporting large debris. This pose risks to road stability, safety, and erosion control. There's no adequate drainage to channel the stormwater out of the road during rainfall. After every rainstorm the road gets washed away and has to be frequently rehabiliated to provide mobility for the reserve tourists and personnel.	Import G5 gravel material, for backfill around culverts. Install 3 x 900 x 900mm culverts in deeper watercourse. Construct gabion wingwalls on both LHS & RHS of the road, 40m x 1.2m height.	
40	1925	0				
42	1925	0				
43	1925	0				
45	2252	327				
44	2252	0	3.Average	The road exhibits natural firmness and is in moderate condition. However improve the stormwater drainage infrastructure.	Construct angular gravel humps every 50m interval to facilitate stormwater runoff and prevent soil erosion. Import G5 gravel material 150mm thickness.	
46	2314	62				
47	2314	0				
52	2360	46				
51	2360	0	5.Critical	There's a 80m wide watercourse intersecting the road, and existing gabion mattress on the LHS. The road edge is strewn with boulders, cobbles, and sediment on the RHS, indicating high-energy water flow capable of transporting large debris. This poses risk to road stability, safety, and erosion control. After every rainstorm the road gets washed away and has to be frequently rehabiliated to provide mobility for the reserve tourists and personnel.	Import G5 gravel material, between culverts. For 80m: install 2x 600 x 600mm culverts every 10m spacing. Total of 16 culverts for a length of 80m. Construct gabion walls on both LHS & RHS of the road, 80m x 1m height.	
48	2385	25				
49	2385	0				
54	2405	20				
55	2517	112	3.Average	The road exhibits natural firmness and is in moderate condition, however improve the stormwater drainage infrastructure.	Construct angular gravel humps every 50m interval to facilitate stormwater runoff and prevent soil erosion. Import G5 gravel material 150mm thickness.	
56	2675	158				
57	2972	297				
58	3118	146				
59	3462	344	5.Critical	There's a watercourse intersecting the road. The road exhibits signs of moderate to severe wear. The presence of standing water in depressions indicates inadequate stormwater drainage infrastructure. Ruts have been exacerbated by recent rainfall, resulting in muddy, saturated conditions.	Import G5 gravel material around concrete. Construct in-situ concrete drift: strength of concrete 30MPa, 5m x 3m x 0.15m thickness. Construct a gabion wingwall on both LHS & RHS of the road, 20m x 0.8m height.	
60	3462	0				
61	3462	0				
62	3657	195	3.Average	The road exhibits natural firmness and is in moderate condition, however improve the stormwater drainage infrastructure.	Reshape the existing gravel humps. Import G5 gravel material 150mm thickness.	
63	3898	241				
64	3932	34				
65	4412	480				
66	4788	376				
67	5106	318				
68	5106	0	5.Critical	There's a watercourse intersecting the road. The road edge is strewn with boulders, cobbles, and sediment on the RHS, indicating high-energy water flow capable of transporting large debris. This poses risk to road stability, safety, and erosion control. The presence of standing water in depressions indicates inadequate stormwater drainage infrastructure. After every rainstorm the road gets washed away and has to be frequently rehabiliated to provide mobility for the reserve tourists and personnel.	Introduce a crossfall to facilitate lateral drainage and minimize water pooling in wheel path. Reshape the existing gravel humps. Construct in-situ concrete drift: strength of concrete 30MPa, 5m x 3m x 0.15m thickness. Import G5 gravel material around concrete.	
69	5106	0				
70	5106	0				
71	5670	564	3.Average	The road exhibits natural firmness and is in moderate condition, however improve the stormwater drainage infrastructure.	Import G5 gravel material, 150mm thickness. Construct angular gravel humps at 50m intervals.	
72	5670	0				
73	5670	0				

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Page: 1 Our Ref: 11755010

PROJECT:	Cape Nature Condition Assesment				DATE:	2025-06-10
DESCRIPTION:	Gamkaberg Nature Reserve - Road B (0.03km) Road Management					
Photo ID	**Stake Value**	**Distance**	**Priority**	**Description**	**Erosion Control and Drainage Measures**	
3	0	0	5.Critical	There's a watercourse intersecting the road. The road edge is strewn with boulders, cobbles, and sediment on the RHS, indicating high-energy water flow capable of transporting large debris. This poses risk to road stability, safety, and erosion control. After every rainstorm the road gets washed away and has to be frequently rehabiliated, and backfilled to provide mobility for the reserve personnel. Personnel is often stranded. Either unable to reach their accommodation after work or stuck inside and unable to report for duty.	Install 4 x 600 x 600 culverts. Construct gabion wingwalls on the RHS and LHS of the road, 15m x 1m height Import G5 gravel material around culverts.	
4	30	30				

ANNEXURE B

ATTENDANCE REGISTER

CapeNature

Meeting / Workshop / Training Session Attendance Register

Name of Event:	Stormwater Road Flood Damage Assessment	Venue:	Gamkaberg
Date:	10/6/2025	Time:	9h30
Service Provider/ Chairperson:	V3 Consulting	Facilitator/ Scribe:	

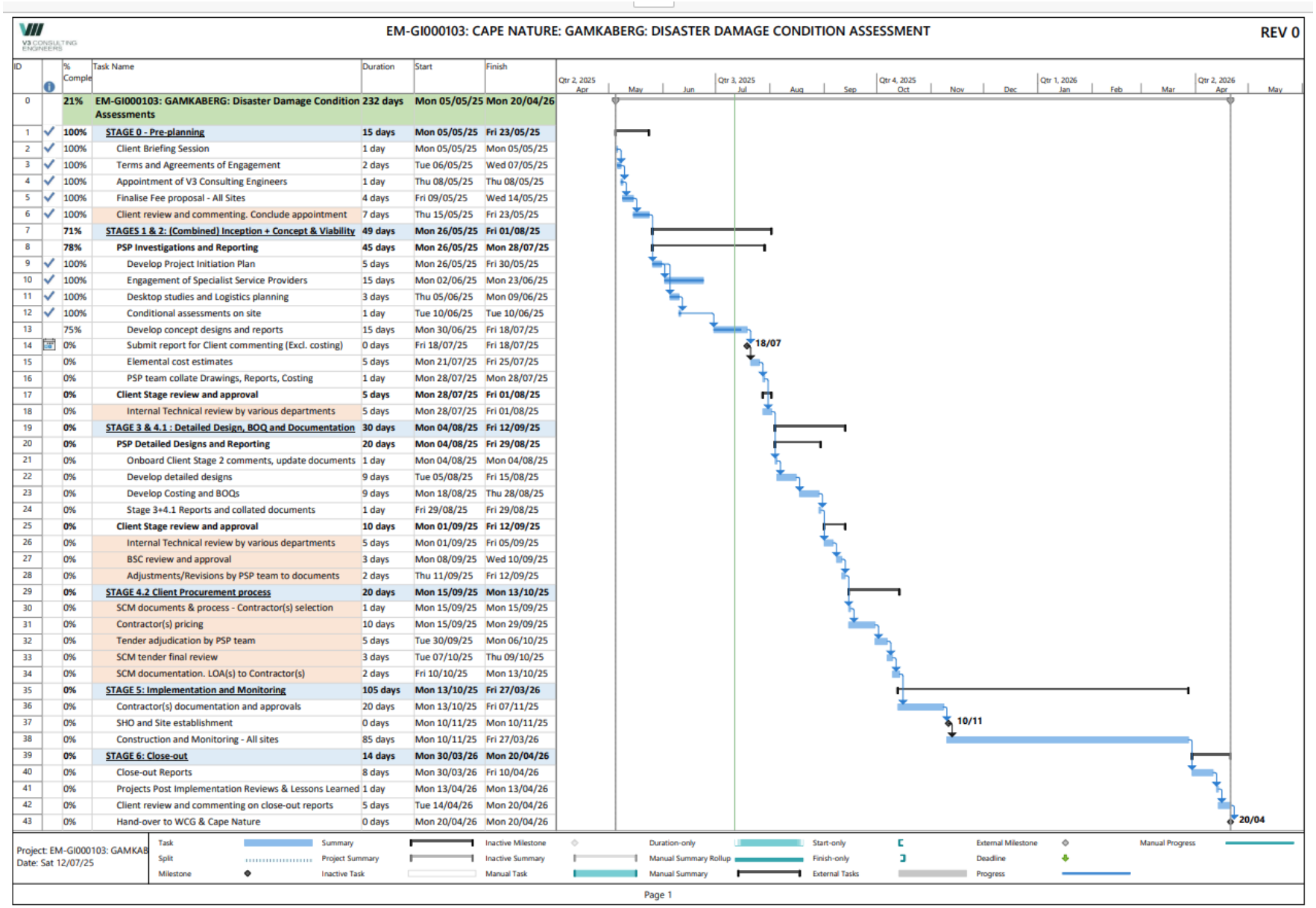
EMPLOYEE/ATTENDEE DETAILS

No	Employee Number	First Name	Surname	Designation/ Job title	Directorate/ Component	Telephone number	Email address	Gender M	Gender F	Signature
		Lukie	van Staden	V3	Engineer	0825277690	lukie.vanStaden@v3consulting.co.za	✓		
		GAOTLHOLWE	KENALEMANG	V3	Structural engineer	0618373737	gao.kenalemang@v3consulting.co.za	✓		
		Phakama	Qashani	V3	Civil intern	0739350337	Phakama.Qashani@V3 Consulting		✓	
		Valentino	Kaespuy	Gamkaberg	Conservation assistant	0657524119	V.Kerspuy@capenature.co.za	✓		
		Willem	Goemas	Gamkaberg	Field ranger	073 4861 096	wgoemas@capenc	✓		
		Singatha	Mtumtum	DoI	Works inspector	072 7453250	Singatha.Mtumtum@westerncape	✓		
		SISONKE	FOMBO	DoI	Chief works inspector	044 8138822	Sisonke.fombo@westerncape	✓		

Page number:

ANNEXURE C

PROVISIONAL PROJECT SCHEDULE: STAGES



EM-GI000103: CAPE NATURE: GAMKABERG: DISASTER DAMAGE CONDITION ASSESSMENT — **REV 0**

ID	% Complete	Task Name	Duration	Start	Finish
0	21%	**EM-GI000103: GAMKABERG: Disaster Damage Condition Assessments**	232 days	Mon 05/05/25	Mon 20/04/26
1	100%	**STAGE 0 - Pre-planning**	15 days	Mon 05/05/25	Fri 23/05/25
2	100%	Client Briefing Session	1 day	Mon 05/05/25	Mon 05/05/25
3	100%	Terms and Agreements of Engagement	2 days	Tue 06/05/25	Wed 07/05/25
4	100%	Appointment of V3 Consulting Engineers	1 day	Thu 08/05/25	Thu 08/05/25
5	100%	Finalise Fee proposal - All Sites	4 days	Fri 09/05/25	Wed 14/05/25
6	100%	Client review and commenting. Conclude appointment	7 days	Thu 15/05/25	Fri 23/05/25
7	71%	**STAGES 1 & 2: (Combined) Inception + Concept & Viability**	49 days	Mon 26/05/25	Fri 01/08/25
8	78%	**PSP Investigations and Reporting**	45 days	Mon 26/05/25	Mon 28/07/25
9	100%	Develop Project Initiation Plan	5 days	Mon 26/05/25	Fri 30/05/25
10	100%	Engagement of Specialist Service Providers	15 days	Mon 02/06/25	Mon 23/06/25
11	100%	Desktop studies and Logistics planning	3 days	Thu 05/06/25	Mon 09/06/25
12	100%	Conditional assessments on site	1 day	Tue 10/06/25	Tue 10/06/25
13	75%	Develop concept designs and reports	15 days	Mon 30/06/25	Fri 18/07/25
14	0%	Submit report for Client commenting (Excl. costing)	0 days	Fri 18/07/25	Fri 18/07/25
15	0%	Elemental cost estimates	5 days	Mon 21/07/25	Fri 25/07/25
16	0%	PSP team collate Drawings, Reports, Costing	1 day	Mon 28/07/25	Mon 28/07/25
17	0%	**Client Stage review and approval**	5 days	Mon 28/07/25	Fri 01/08/25
18	0%	Internal Technical review by various departments	5 days	Mon 28/07/25	Fri 01/08/25
19	0%	**STAGE 3 & 4.1 : Detailed Design, BOQ and Documentation**	30 days	Mon 04/08/25	Fri 12/09/25
20	0%	**PSP Detailed Designs and Reporting**	20 days	Mon 04/08/25	Fri 29/08/25
21	0%	Onboard Client Stage 2 comments, update documents	1 day	Mon 04/08/25	Mon 04/08/25
22	0%	Develop detailed designs	9 days	Tue 05/08/25	Fri 15/08/25
23	0%	Develop Costing and BOQs	9 days	Mon 18/08/25	Thu 28/08/25
24	0%	Stage 3+4.1 Reports and collated documents	1 day	Fri 29/08/25	Fri 29/08/25
25	0%	**Client Stage review and approval**	10 days	Mon 01/09/25	Fri 12/09/25
26	0%	Internal Technical review by various departments	5 days	Mon 01/09/25	Fri 05/09/25
27	0%	BSC review and approval	3 days	Mon 08/09/25	Wed 10/09/25
28	0%	Adjustments/Revisions by PSP team to documents	2 days	Thu 11/09/25	Fri 12/09/25
29	0%	**STAGE 4.2 Client Procurement process**	20 days	Mon 15/09/25	Mon 13/10/25
30	0%	SCM documents & process - Contractor(s) selection	1 day	Mon 15/09/25	Mon 15/09/25
31	0%	Contractor(s) pricing	10 days	Mon 15/09/25	Mon 29/09/25
32	0%	Tender adjudication by PSP team	5 days	Tue 30/09/25	Mon 06/10/25
33	0%	SCM tender final review	3 days	Tue 07/10/25	Thu 09/10/25
34	0%	SCM documentation. LOA(s) to Contractor(s)	2 days	Fri 10/10/25	Mon 13/10/25
35	0%	**STAGE 5: Implementation and Monitoring**	105 days	Mon 13/10/25	Fri 27/03/26
36	0%	Contractor(s) documentation and approvals	20 days	Mon 13/10/25	Fri 07/11/25
37	0%	SHO and Site establishment	0 days	Mon 10/11/25	Mon 10/11/25
38	0%	Construction and Monitoring - All sites	85 days	Mon 10/11/25	Fri 27/03/26
39	0%	**STAGE 6: Close-out**	14 days	Mon 30/03/26	Mon 20/04/26
40	0%	Close-out Reports	8 days	Mon 30/03/26	Fri 10/04/26
41	0%	Projects Post Implementation Reviews & Lessons Learned	1 day	Mon 13/04/26	Mon 13/04/26
42	0%	Client review and commenting on close-out reports	5 days	Tue 14/04/26	Mon 20/04/26
43	0%	Hand-over to WCG & Cape Nature	0 days	Mon 20/04/26	Mon 20/04/26