



APPENDIX I OF THE 2025 ACTION PLAN FENCING AS A MANAGEMENT METHOD

THE CAPE PENINSULA BABOON MANAGEMENT JOINT TASK TEAM

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11 BACKGROUND

Strategic fencing erected at the interface between natural and human-transformed landscapes is a common non-lethal tool utilised for wildlife management globally. However, owing to their intelligence and agility, baboons are often able to overcome conventional fence designs with ease. Thus, purpose-built baboon-proof fencing designs are required when considering fencing as a feasible management tool. Although baboon-proof fence designs vary slightly (e.g., Findlay et al., 2022; Kaplan. 2013), several fundamental design concepts must be integrated to ensure an effective outcome. These concepts include fence heights that are sufficient to prevent jumping or climbing over (i.e., > 2.0 m and ca. 5 m away from overhanging trees), impenetrable fence mesh sizes (i.e., 75 mm width x 100 mm height), the use of electrified overhangs or outriggers to deter scaling and ground-level barriers to prevent digging underneath the fence. Critically, regular maintenance of fence lines and associated infrastructure is imperative to ensure fence integrity and long-term effectiveness (Wilkinson et al., 2021). Together, fencing has proven to be an important tool for wildlife management across Africa (e.g., Pekor et al., 2019) and has direct applications to sustainably mitigate baboon-human conflict in Cape Town (Kaplan. 2013).

12 RATIONALE

The primary method for mitigating baboon access to human-transformed landscapes in Cape Town currently relies on baboon rangers and the use of pain aversion techniques (e.g., paintball markers). However, with few hard boundaries defined at the natural-urban interface, baboons regularly challenge ranger efforts to opportunistically forage within the urban environment. Even brief incursions by baboons into urban environments can cause adverse health and welfare outcomes for baboons, damage to property and negative physical and psychological outcomes for people and pets.

This has created a significant imbalance between the resources harnessed to manage baboons using rangers in isolation and the efficacy of this management tool. As such, public attitudes to baboons and their management are at low levels, with many communities finding themselves at an unsustainable crisis point, experiencing near daily baboon incursions into urban environments. Therefore, coupling a well-designed, well-maintained hard boundary (i.e., baboon-proof fencing) with strategically positioned rangers/centurions, who also support fence maintenance, can significantly reduce baboon (and other vulnerable wildlife) incursions into urban areas, while enhancing the overall ecological and financial sustainability of these complementary management tools. Together this strategy aims to achieve a positive outcome for the health and welfare of baboons and improve the current pressure on high-conflict communities on the Peninsula.

13 FENCING ON THE PENINSULA

In Cape Town, the construction of a 2.3 km baboon-proof fence was successfully completed around the baboon affected suburb of Zwaanswyk in 2012. Coupled with a strategic baboon ranger presence at the exposed entrance of the suburb, a before-and-after GPS tracking study showed a significant reduction in the frequency of baboon incursions into Zwaanswyk, and thus an effective deterrent to the troop (Kaplan, 2013). More than a decade later, the fence continues to serve its purpose, largely excluding baboons from the area with the assistance of the baboon ranger employed by the Zwaanswyk Association of Property Owners (ZAPO) and a dedicated fence maintenance budget. Importantly, the ecological goals of the fence were prioritised during the

planning stages rather than installing a high-security fence that was not fit for purpose. Thus, while the Zwaanswyk fence has since received security upgrades (i.e., cameras, security presence), the fundamental design and emphasis on maintenance of the infrastructure has ensured the success of a long-term cost-effective (initial investment ~ ZAR 1.3 million) baboon-proof fence.

As a result, the design specifications of the Zwaanswyk fence, modelled off the Barrydale baboon sanctuary fence, are considered the 'gold standard' for baboon-proof fencing in Cape Town (O'Riain & Hoffman 2010; **Error! Reference source not found.**; Supplementary material 1.). However, despite the proven success at Zwaanswyk and the subsequent publication of a fencing feasibility and prioritisation study (e.g., NCC, 2022 – Baboon-proof Fencing for the Cape Peninsula), baboon-proof fencing has not been implemented at scale elsewhere on the Peninsula.

The only significant attempt at large-scale fencing is along the Constantia wine farm region, where private landowners have constructed fences along their boundaries with Table Mountain National Park. However, the fencing infrastructure in this region:

- Has not followed a standardised or ecologically informed design
- Lacks regular maintenance and coordination across properties
- Is unsupported by an integrated ranger programme

Consequently, the fencing in Constantia has had limited effectiveness, leaving gaps that baboons and entire troops exploit regularly to access farms (e.g., TK, ZW, MT1, MT2) and adjacent residential areas (e.g., CT1 and CT2), resulting in persistent human-baboon conflict.

For baboon-proof fencing to function as an effective long-term management tool on the Peninsula, it must extend beyond isolated areas to form a collaborative network of clearly defined hard boundaries at the interface between human-transformed and natural spaces. Importantly with actions 1.5.1 and 1.5.2 from the CPBSMP completed (see NCC 2022 – Baboon-proof Fencing for the Cape Peninsula), only action 1.5.3 (i.e., Identify funding mechanisms / vehicles and partnerships through which fencing can be installed and maintained via agreement with community and other stakeholders) needs to be finalised (currently ongoing) according to the CPBSMP to execute the rollout of baboon-proof fencing.

14 THE NORTHERN FENCING OPPORTUNITY

The natural available space (ca. 57 km²) in this region predominantly forms part of Table Mountain National Park, which is surrounded by urbanised landscape from Hout Bay and Constantia in the north, Tokai in the east and Noordhoek to Fish Hoek in the south (Figure 1). Yet, the ca. 300 baboons of the northern subpopulation collectively only utilise ca. 19 km² of this natural space. Historically, troops in this region have exhibited small estimated home ranges and higher than average baboons per km² (Hoffman and O'Riain, 2012). While this is due in part to the higher calorific alien vegetation in the area, with ineffective fencing, access to the vineyards and adjacent residential areas of Constantia and Tokai requires little movement to find food (**Error! Reference source not found.**). Combined with the limited availability of low-lying land, particularly in the north of the park, and the systematic northward diffusion of small groups (i.e., CT1 and CT2), baboons and humans find themselves in regular conflict.

Fencing this region is not a new concept, and a previous fencing prioritisation study identified the opportunity to create a continuous hard boundary from Zwaanswyk in the south to Constantia Nek. Critically, establishing a hard boundary along the interface between natural habitat and the wine farms in the north prevents northern troops from accessing an array of urban and agricultural

attractants, thereby reducing their exposure to associated risks (Figure 2; NCC, 2022). Recent engagement (April 2025) with landowners in the region has yielded a promising collaborative approach for a public-private cost-sharing partnership between the City of Cape Town and landowners to support the installation and long-term maintenance of this infrastructure. Encouragingly, this has been matched by significant progress in technical and environmental planning, including cost estimations and infrastructure assessments from electric fencing contractors.

The convergence of political will, stakeholder commitment, and technical planning in the north presents an opportunity to timeously (ca. 1 year) deliver on a high-impact baboon-human conflict mitigation on the Peninsula, and prioritising this strategy would:

- Enable the northern baboon troops to establish more ecologically appropriate ranging patterns
- Reduce anthropogenically derived injury and death for baboons
- Reduce sustained pressure on communities and businesses at the densely populated urban edge of Table Mountain National Park
- Provide skill development opportunities (electric fencing and fencing technicians)
- Not limit any public access to Table Mountain National Park
- Act as a model for further baboon-proof fencing on the Peninsula

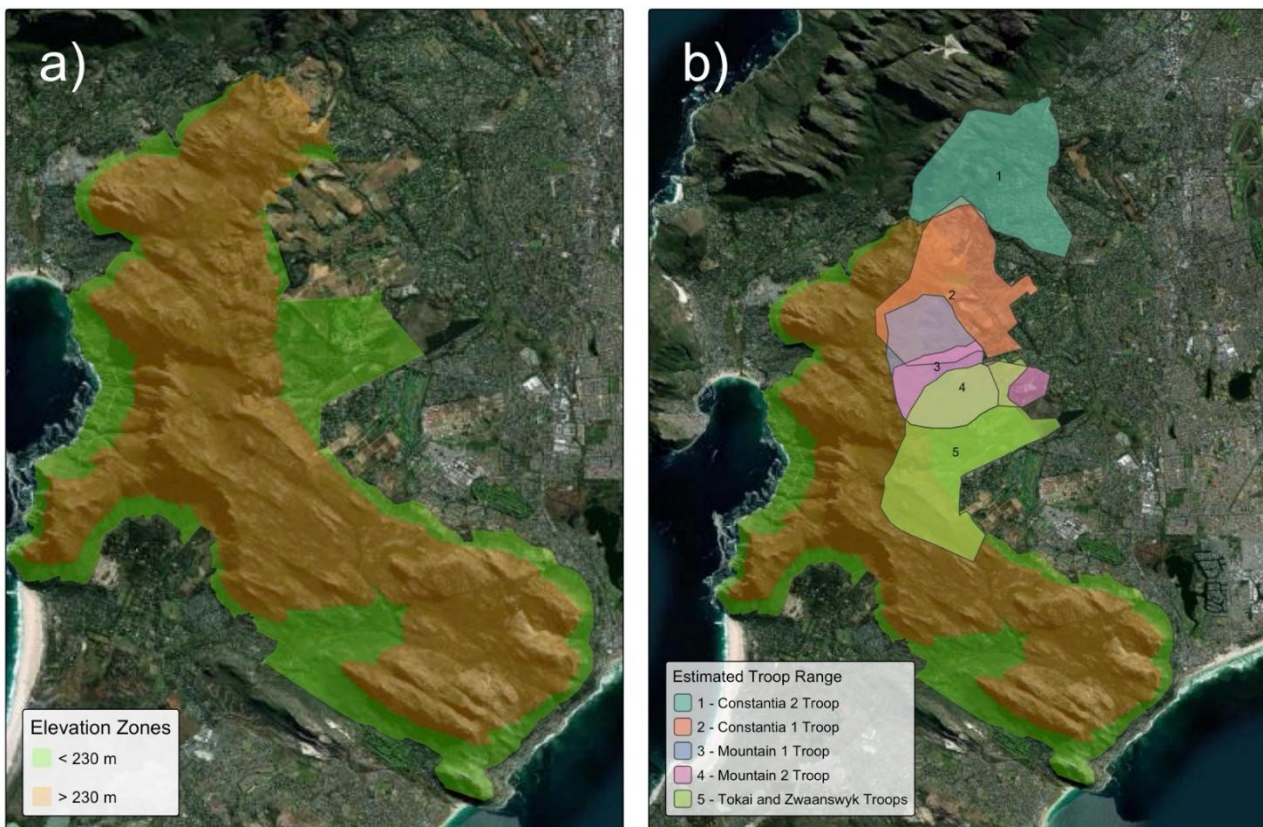


Figure 1: Shaded area reflects the natural space available for the northern subpopulation of baboons which broadly falls within Table Mountain National Park (~ 57 km²). Green shaded area reflects suitable low-lying land (< 230 m elevation) and less suitable habitat > 230 m elevation (orange). b) Estimated range for the six northern troops. Note the splinter troops of CT1 and CT2 already reside beyond Constantia Nek close to or in residential areas with the remaining troops ranging into Tokai and on the wine farms.

15 IMPLICATIONS OF THE NORTHERN FENCE STRATEGY

Coupled with action plan items of removal and contraception, this holistic strategy will provide four northern troops and residents with the necessary habitable space and hard boundaries to reduce conflict and improve baboon welfare outcomes in the region. Lower net calorific diets for northern troops due to a more natural diet should also increase the inter-birth interval and stabilise the rate of population growth. Importantly, integrating fencing with these other tools ensures a sustainable future for the northern subpopulation. Together, these outcomes align with the principles of baboon management and position baboon-proof fencing as a pragmatic investment in sustainably reducing human-baboon conflict in the north.

To achieve a 10 km baboon-proof hard boundary for the northern subpopulation of baboons, a coordinated and shared-cost financing model will be necessary between six private landowners, TMNP and the City of Cape Town to conduct:

- Major upgrades of electrified fencing along 5 km of fence line
- Minor upgrades of electrified fencing along 3.1 km of fence line
- New construction of ~ 2.9 km of electrified fencing

Baboon-proof fencing will end at the northwestern boundary of Silvermist, and the boundary between natural space and Hout Bay will require ongoing monitoring by baboon rangers to prevent north and westward urban incursions. Baboons that cross baboon-proof fencing or the boundary to Hout Bay will be managed with the revised guidelines (see revised guidelines). A structured monitoring and evaluation framework will need to be implemented, including regular physical audits of fence integrity, conducting baboon GPS tracking pre- and post-fencing as well as incident reporting. Metrics such as the frequency of incursions, activity budgets and baboon injury or mortality rates should be tracked quarterly to assess outcomes and inform adaptive management.

For baboon-proof fencing to be successful in the north the following actions will need to be completed.

Action	Status
Private landowners need to agree upon a cooperative fencing approach with the City of Cape Town to ensure specifications are consistent along the fence line.	<ul style="list-style-type: none"> Completed
The JTT need to approve the concepts of a northern boundary to establish further formal commitment from landowners and SANParks.	<ul style="list-style-type: none"> Completed
The JTT will need to endorse several other action plan items to ensure a holistic strategy can be implemented for the North hard boundary.	<ul style="list-style-type: none"> Pending Approval of Action Plan – Decision by Q4 2025
Engagement with SANParks about fence alignment of three new fences to be constructed.	<ul style="list-style-type: none"> In progress
Identify environmental and electric fencing legislation triggers (e.g., indigenous vegetation clearance or water courses) and provide pathways to ensure infrastructure complies and correct permits are secured	<ul style="list-style-type: none"> In progress – engagement with SANParks, environmental consultancies, electric fencing technical committees Creation of a matrix to track environmental authorisations, landowner agreements, and electric fencing regulations
Identify and formalise clear governance structure or oversight committee, including representatives from CoCT, SANParks, private landowners and CBP	<ul style="list-style-type: none"> In progress
A cost sharing model for the construction and long-term maintenance will need to be proposed and agreed upon with private landowners, SANParks and the City to begin rolling baboon proof fencing out.	<ul style="list-style-type: none"> Engaged with electric fencing companies and suppliers. Quotes from all interested received 20th June 2025 Cost-sharing model to be agreed upon by owners by end June 2025
Agreements for the Cape Baboon Partnership to manage an integrated ranger and fence maintenance programme for the north	<ul style="list-style-type: none"> In progress – formalise partnership for coordinated rangers June 2025 in the interim

16 SCALING FENCING IN THE SOUTH AND FUTURE FENCING RESEARCH

Several communities across the Peninsula are experiencing similar pressures. A secondary phase of cost-effectively scaling baboon proof-fencing for other high-conflict areas such as Kommetjie/Ocean View/Capri and Scarborough needs thorough consideration. While these areas are marginally more complicated to construct fencing due to a larger number of landowners with differing views on fencing, identifying pathways to achieve and agree on the construction of hard boundaries in these areas should be a priority for landowners, residents and the authorities.

To support the continued implementation of baboon-proof fencing across the Peninsula, research should focus on improving the cost-effectiveness, ease of maintenance, and long-term efficacy of baboon-proof fencing, ensuring that designs remain ecologically effective and practically viable for diverse landscapes and management contexts. Actively exploring alternative fencing designs in collaboration with subject matter experts (i.e., scientists, electric fencing and fencing experts), while staying aligned with broader socioecological management goals is a critical component of effective monitoring, evaluation, and iterative improvement. This adaptive approach ensures that management remains responsive to evolving environmental and social conditions, but also seeks to provide a scalable cost-effective fencing solution.

By proactively leading research and innovation in this area, Cape Town has the opportunity to lead by example (as the city has in other human-wildlife conflicts) and make a meaningful contribution to the field of urban-wildlife conflict mitigation domestically and internationally. Therefore, the JTT are encouraged to take a proactive and engaging stance towards the research and development of fencing innovations.

17 SUPPLEMENTARY MATERIAL 1- SPECIFICATIONS

***Due to updated electric fencing legislation (2023), certain aspects of the Zwaanswyk fence design may need adjusting to conform. Final design schematics and proposals will be submitted with the electric fencing supplier and fence installer. All fence and electrified fencing specification modifications will be considered due to technological advances since the completion of the Zwaanswyk fence. The broad design of the fence should include;**

- **The removal of existing fence infrastructure**
- **Clearing and grubbing of trees and vegetation 4 – 5 m either side of the fence line**
- **2.4 m 75 x 100 mm or 100 x 100 mm galvanised square mesh game fence style fencing**
- **Up to 600 mm of under dig built in to prevent wildlife gaining access under the fence**
- **Straining posts will need to be a minimum of 3 m, made from either CCA treated wooden posts or galvanised steel equivalent spaced at ~ 50 m**
- **Intermediate fence support posts are to be spaced < 10 m a part depending on the dropper material which could be either ~3 m 80/100 CCA treated timber poles or galvanised steel equivalent**
- **Fence foundations will at a minimum consist of 400–600 mm deep (15 MPa) concrete for the straining posts**
- **Electrification of the fence will either need to be through a mains supply or solar system**
- **Electrification of the fence will require at a minimum 2 mm high strain galvanised wire for all strands**

- **Electrified strands shall be installed on galvanised offset brackets fixed to the barrier fence posts. The configuration may comprise either a vertical alignment covering the full fence height or an angled overhang at the upper section**
- **The fence shall be earthed at 50 m intervals using 10 mm diameter hot-dip galvanised ground spikes in accordance with SANS 10222-3 standards**
- **A series of pedestrian and vehicular gates will be required and designs will need to be agreed upon on a case by case basis. Nevertheless all pedestrian, swing and sliding gates must be integrated into the electrified system**
- **Before construction begins, the contractor must submit a final design schematic showing the fence alignment, component layout, and electrical configuration. This schematic must be reviewed and formally approved by all parties to confirm that it represents the agreed specification for the works**

The Zwaanswyk electric fencing tender originally drawn up by the Zwaanswyk Association of Property Owners (ZAPO) is given below as an example of detailing the scope of works and design plan for the northern fence project. Any manufacturers or products mentioned in this document are provided solely as examples, and installers are not required to use these specific brands or models. *

L7.1 ZWAANSWYK ELECTRIFIED FENCE TENDER SPECIFICATIONS (2011)

An electrified security fence, approximately 2.2 km long, is to be erected on the boundary of the Zwaanswyk neighbourhood and is intended as an effective deterrent and barrier to both humans and baboons wishing to gain entry to Zwaanswyk from the open SANParks land adjacent to Zwaanswyk. The fence includes several access gates that are detailed in this document.

The fence will be within the SANParks plantation area and must run in straight lines, at a distance of approximately 4 -5 (four to five) metres from the boundary of Zwaanswyk residential properties abutting the Park on the northern and north western boundaries and at a distance of approximately 2 (two) metres from the existing fence line with the Park on the south western boundary . More details on the exact position of the fence line are given in the Addendum and the exact length of the fence sections is subject to measurement by the tenderer.

The specifications for the fence construction contract covers various aspects of the fence, as detailed below.

L7.1.1 Materials and Construction:

- **Fence**

The fence is to be 2.4m high Bonnox wire mesh supported on 3,0m long 100/119mm Chromium Copper Arsenate (CCA or "Tanalith") -treated wooden posts (0,6m extending below ground level) at a maximum of 10m centres. The tenderer is to adjust their support posts spacing where necessary, giving due regard to the terrain. Corner, straining and gate posts are to be 3.6m long 119/139mm CCA-treated wooden posts. Gate posts may alternatively be hot-dip galvanised square or round tube with top caps. Corner and gate posts are to be 3.6m long 100/119mm CCA-treated wooden posts at a maximum of 100m centres and extending 1m into the ground for founding purposes. Three 3.0m long 25/50mm CCA- treated wooden "droppers" are to be placed between the treated wooden posts. The Bonnox is to be a 100x100m mesh constructed of 2mm high tensile and 2mm steel galvanized wire. A hot-dipped galvanized steel "wall top"

offset bracket to support electrified wires mounted on plastic bobbins and extending 45-60° from the horizontal is to be affixed to the upper end of each fence post facing towards the Park side of the fence:

- **Fence post foundations**

All wooden fence support posts are to be founded in concrete according to the following specifications:

- (i) Non-straining support posts: minimum 400mm x 400mm square x 500mm deep.
- (ii) Straining, corner and gate posts: minimum 450mm x 450mm square x 600mm deep.
- (iii) All foundation concrete to be minimum 15MPa crush strength and all concrete foundations are to be constructed so as not to protrude above ground level.

- **Anti-Dig Provisions**

An anti-dig provision must be provided to deter animals and humans from digging under the fence. The design of the subterranean structure of the fence is to be recommended by the tenderer, having regard to rocks and tree roots, especially on the western boundary.

- **Electrification of the Fence**

The electric fence is to consist of horizontally mounted strands of high-strain galvanized steel wire, a minimum of 2mm in gauge to run the entire length of the fence and to be electrically energized for security deterrence purposes. The horizontal wires are to be placed on UV-stabilized plastic bobbins, or similar, on the side of the fence facing SANParks land on offset brackets at 150mm vertical spacings for the full 2.4m height of the Bonnox fence. There will be no additional electrified straining wires on the vertical 2.4m section of the fence in addition to these wires on offset brackets. Both the Bonnox wire *and* the electrified wires on offset brackets are to be placed on the SANParks side of the posts supporting the fence. A further six horizontal strands of the same specification wire are to be placed on 20mm x 5mm flat bar hot-dip galvanized "wall top" brackets that are also to run the entire length of the fence with the bracket angle at 45-60° from the horizontal, provided the wall top brackets are sufficiently braced to prevent distortion under tension or bending to gain access over the top of the fence. Should the tenderer choose to use unbraced wall top brackets the brackets should be galvanized square tube with minimum dimensions of 19 x 19mm and corner straining brackets galvanized square tube with minimum dimensions of 50x50mm. The "wall top" brackets are to be affixed to the top of all the wooden fence support posts and angled towards the SANParks land with affixes made by means of at least 2 galvanized screws or bolts per bracket through holes that have been drilled for this purpose prior to hot-dip galvanizing of the brackets. Three additional wire offset brackets for supporting additional electric wires on plastic bobbins on each bracket with the same wire specification as above are to be placed at optimum vertical distances apart on the vertical side of the entire length of fence facing SANParks land.

- **Earthing of fence**

The Bonnox fence is to be earthed by means of ground spikes comprising 150mm long hot-dip galvanized minimum of 10mm diameter reinforced steel bars containing a drilled earth wire lug welded to the bar prior to galvanizing. Earth spikes are to be placed at intervals of 50m along the length of the fence.

- **Warning Lights and Signs**

Waterproof, low wattage red flashing LED indicators, such as the Stafix N704 model, or similar, are to be placed 1.5m above the ground along the entire fence length **with a maximum of 2 per energizer**

zone so that they flash when the fence is energized. UV-stabilised SABS-approved danger warning notices are also to be placed at a height of 1.5m on the fence every 25m so that they are positioned adjacent to and in between each flashing LED indicator.

- **Zones**

The fence is to be divided into zones with two (2) zones per energizer which will enable rapid response to a zone in the event of an incursion and simplify the maintenance procedures. The contractor will be provided with the location of the power sources from adjoining residences at the time of commencement of construction of the fence. The number and length of the zones is for each tenderer to recommend, with a minimum of 6 zones and a maximum of 10 zones.

- **Energisers**

Locally supplied and supported energizers capable of supplying 2 (two) zones with an output of no less than 4 (four) Joules per zone and complying with EMC standards. The contractor is to have the energizers installed and tested to the satisfaction of the ZAPO- appointed site representative. The energizers are to be able to independently support both zones and have built-in automatic back-up batteries sufficient for 24 hours of operation off mains supply. All the energizers are to be provided with appropriate telemetry equipment to allow for the automatic transmission of energizer and zone conditions to a remote control centre. The security monitoring company Mountain Men will be responsible for providing and installing the radio equipment on the energizers. The Energizers are to be housed in water-proof lockable boxes located and powered at local residences adjacent to the fence with the details of these residences provided to the contractor at the time of commencement of the installation.

- **Gates**

Three different types of gates are required for the fence installation with all three gate types carrying electrified wire protection, both on the vertical Parks side of the gates and on "wall top" 60° offset brackets attached to the top of the gates and in alignment with the fence "wall top" brackets. Two of the gate types are to be electrically opened and closed and one gate type is to be a manually operated gate.

The locations of all of the gates will be provided to the contractor at the time of commencement of the installation. All gate types below need to be constructed from either square or round steel tubing with a minimum wall thickness of 2.0mm and minimum diameter or square section of 50mm and hot-dip galvanized as a complete gate frame *after* attachment point screw holes for the Bonnox, wire bobbins and "wall top" brackets have been drilled.

L7.1.2 Electrically operated gates

L7.1.2.1 Automated sliding gates

There are to be 1 (one) 2m wide and 1 (one) 3m wide motorized sliding gates that are to be automated to accommodate riders on horses as well as pedestrians passing safely through the gate from both sides .

The sliding gates are to be mounted on an inverted 40 x 40mm angle iron track with a gauge of 3mm gauge to which anchoring lugs have been welded for the purpose of securing the track in the reinforced concrete plinth in the gate opening with the track having been hot-dip galvanized after the welding of the lugs. The sliding gates also require an infra-red transmitter and receiver positioned on the gate posts at either end of the gate opening at 500mm above ground level and connected to the gate motor control mechanism to ensure that the gate

doesn't close on an obstruction in the gate opening.

The sliding gates are to have T-shaped concrete plinths into which the gate tracks are mounted and are to extend the full width of the gate openings between the gate posts and extend along the fence line to accommodate the necessary track length. The base of top of plinth is to be flush with the in-situ ground. All plinths to have 6mm reinforcing mesh in vertical and horizontal members. The top of the plinth's "T" is to be 200mm wide and 125mm deep with upper surface cambered and smooth steel-floated finish. The lower part of the "T" is to be minimum a of 200mm deep and 100mm wide. The concrete in the plinths is to be vibrated and have a minimum 25MPa crush strength and 25mm cover to all reinforcing. The electric motors for the sliding gates must be mounted on a 25MPa concrete plinth so that they are protected from the ingress of ground water and soil and are to be positioned on the Zwaanswyk side of the fence. A gate brush, such as a "Mr Sweepy", or similar, is required to be affixed to the bottom of the sliding gates to ensure that the track remains swept free of dirt and stones. A 38mm diameter or square minimum 2mm thickness hot-dipped galvanized post with a mounting plate of minimum thickness 3mm is required for the access tag receivers – see section L7.1.4 – for the sliding gates (i.e. 4 posts) so that the gates can automatically be opened from a horizontal distance of 2m from both sides of the gates. The post must be 2m long so that it extends 1.5m above ground level and 0.5m into a concrete foundation of dimensions 0.3x0.3m square and 0.3m deep 15MPa concrete. The posts will need to accommodate electrical wiring that will extend at least 300mm deep under the ground in an electrical conduit to the gate. The exact location of these posts will be provided to the contractor on site. Each post will require a tag reader mounted on the plate for the purpose of automatically opening the gate.

L7.1.2.2 Electrically-latched swing gates

There are also to be 2 (two) 1m wide electrically latching pedestrian swing gates provided with a spring mechanism so that they that automatically close and latch when the gate is left unattended.

The electrically-latched swing gates are to be provided with an access tag receiver – see section L7.1.4 – on either both sides of the gates or positioned in such a way that a pedestrian can safely place an access tag against the receiver on either side of the gate without receiving an electric shock. The access tag receiver needs to be mounted 1.5m above ground level.

All the electrically-latched swing gates as well as the double-leaf manually operated swing gate are to have a magnetic contactor that triggers an alarm condition that is transmitted wirelessly to the security control room should a swing gate remain open for over 2 minutes. Both sliding gates are also required to have the same alarm condition transmitted to the control room should these gates remain open for more than 2 minutes.

L7.1.2.3 Manually operated swing gate

Two additional 3m wide double-leaf swing gates for vehicular access are required, one to access the main reservoir on the western boundary and the other adjacent to the reservoir fencing on the Parks side of this reservoir. These gates are to be manually opened and closed and lockable with a sturdy u-bolt lock.

L7.1.2.4 Gate camera posts

A 4m long hot-dip galvanized square or round tubing post is to be positioned at each gate on the Zwaanswyk side of the fence. The diameter or square section of the post is to be 50mm with

a minimum steel thickness of 2mm. The posts are to be placed 750mm deep in the ground in a concrete foundation of a minimum of 15MPa compressive strength and measuring 300mm x 300mm x 400mm deep. Each post requires a steel plate of minimum thickness 3mm and dimensions 100mm x 100mm and with a 10mm hole drilled through the plate welded to each end of the post prior to galvanizing. An electrical conduit at a minimum of 300mm below the ground surface between the base of the post and the gate and containing a draw wire that extends the length of the conduit and through the post is also required. One additional post to those for the gates is also required and the exact location of the posts will be provided to the contractor at the time of commencing the contract.

L7.1.2.5 Additional gate information

All gates are to have the same Bonnox fencing as the fence as well as the same number and specification of electrified wires and "wall top" brackets as the fence but with no off-set brackets. All gates are to have an insulated grab handle on both sides of the gate to allow for safe manual operation of the gates. The tag readers on the gates need to be mounted in such a way a cutout section is required. All gates are also to be provided with a waterproof low wattage red flashing LED indicator, such as the Stafix N704 model, or similar, placed at a height of 1.8m in the middle of both sides of the gate, together with a UV-stabilized warning sign to SABS standards.

L7.1.3 **Construction Environmental Agreement**

The contractor will be required to enter into a Construction Environmental Agreement between the contractor, SANParks and ZAPO to manage the construction process and the removal of all material from the site.

- **Safety on Site**

The contractor will ensure that adequate provisions are made on site to protect members of the public from injury or death as a result of the fence being constructed, including clearly demarcating with danger tape where holes for fence post foundations and trenches have been excavated when leaving the site unattended after-hours and on weekends.

- **Materials on Site**

The contractor will ensure that all materials stored on site are stored safely and securely with due regard to the fact that the site is a public space that is frequented by members of the public, including horse riders. The contractor will also obtain adequate insurance cover against theft of materials from the site or damage of materials by the elements while the fence and gates are being constructed and prior to hand- over taking place.

- **Water and Toilet Facilities**

It is the contractor's responsibility to ensure that adequate water for mixing concrete and personnel use for all personnel the contractor brings onto site for the construction of the fence. A ZAPO representative, however, will endeavour to assist the contractor with obtaining water from nearby residences that are willing to oblige with such a service. The contractor must also provide adequate portable toilet facilities for all such personnel on site.

- **Fire Prevention**

It is the contractor's responsibility to ensure that no open fires are made on site during the construction of the fence and gates and that all necessary precautions are made to prevent uncontrolled fires starting anywhere on site.

- **Storm water erosion management**

ZAPO will take responsibility for ensuring that berms constructed for the purpose of managing storm water runoff are constructed prior to the construction of the fence.

- **Site residential boundary vegetation clearing**

ZAPO will also take responsibility for ensuring that properties with boundary fences that are overgrown with vegetation are cut back sufficiently and trees with overhanging boughs trimmed back prior to the construction of the fence.

L7.1.4 Operation of Fence and Gates

- **Fence**

The fence is to be energized permanently, 24 hours a day, 7 days a week, except for when the section adjacent to a gate is de-activated during ingress and egress by pedestrians or riders on horses through sliding gates, or when deactivation is necessitated by maintenance or repairs to the fence or gates being carried out. The fence will automatically be energized again after a time delay of 10 seconds on closure of any sliding gate that has been opened.

All Energizers are to be provided with a wireless transmitter, or alternative method of communicating that will enable the energizer to automatically transmit a signal to the security company control room that is located several kilometers away and not in the Zwaanswyk area, to provide the status of the energizers, fences and gates. Such transmissions must include immediate notifications of various trouble conditions, including: a break in the fence or gate, failure of any section of fence zone or gate, damage to the electrical fencing and malfunctioning of the energizers.

- **Gates**

All gates are to be powered by a fused and earthed 220V supply enclosed in a conduit buried at least 300mm below ground surface with the electrical supply provided by a nearby residence. Details on the specific residences used to supply the gates with power will be provided to the contractor at the time of commencement of the contract but an average distance of no more than 25m can be assumed for each such connection. All electrical and electronic equipment at the gates is to be housed in waterproof and baboon and human tamper-proof lockable boxes with keys for such boxes supplied to ZAPO.

- **Access control**

The access to all electrically-latched swing gates and automated sliding gates are to be managed by an electronic tag access system such as that supplied by SecuriPower, or similar, whereby access tags are managed using a computerized access management system in that tags can be activated or deactivated at a computer station located at the SANParks office. All hardware and software, including the master head unit tag reader and slave tag readers at each of the gates and the wiring to such devices must be supplied by the contractor. Supply of a physical personal computer (PC) is not required as one will be provided by SANParks for this purpose. In addition, it will be necessary to fit cellswitch, or similar, devices to remote gates and the master head unit to enable communication between the gates and the SANParks computer. The contractor is to have the access control system fully installed and operational and it is not necessary for the tenderer to include any quantity of tags other than those required for testing

purposes. ZAPO will take responsibility for obtaining the required number of tags for the gates for SANParks' requirements and SANParks will manage the issuing of these devices. Tenderers are to include a sum of R36 000 excl. VAT in their tenders, plus any mark-up they wish to make, to make provision for the access control installation to be completed by a subcontractor. This is in accordance with the quotations of R18000 and R36000 for two different access control options respectively, provided by Securipower, and a decision on the preferred solution will be made at the time of fence construction with a rebate of R18000 needing to be provided to ZAPO by the tenderer should the cheaper access control option be selected.

- **Swing Gates**

All the 1m pedestrian swing gates are to be electrically latched with latches released by means of an access tag placed against either one of two receivers placed on each side of the gate, or a receiver positioned in such a way that the pedestrian is not at risk of being shocked. At the time of unlatching the gate is to be deactivated automatically from the energizer so that there is no current flowing in the gate while it is being opened and closed. The gates must automatically close by means of a spring mechanism after having released an open gate and the gate must automatically be energized immediately on latching again in the closed position. ZAPO will take responsibility for obtaining the required number of tags for the swing gates and will manage the issuing of these tags.

- **Sliding Gates**

Both sliding gates are to be motorized and automated to run on the galvanized track detailed in section L7.1.2. All sliding gates are to be opened automatically by means of a tag placed against the tag receiver mounted on the galvanized post 2m distant on either side of the gate. At the time of opening of the sliding gates the energizer supply to the gates and fence adjacent to the gates on both sides of the gates being opened must automatically switch off and only switch on again once the gate has closed again, with a 10 second delay after closing, during which a clearly audible buzzer must sound for the duration of the 10 seconds. The closing of the gate must be automatic after a 20 second time delay and the infra-red beams across the gateway must stop the gate closing and reopen the gate fully for a further 20 seconds if an obstacle is detected in the gateway. The "wall-top" brackets on the sliding gates are to be positioned in such a way that they clear the "wall-top" brackets of the fence when the gate is opening.

L7.1.5 Construction Time Frames

The contractor will be required to provide ZAPO with a detailed project construction schedule, indicating which activities are to take place by specific dates with critical paths identified, such as the provision for hot-dip galvanizing of fabricated gates etc.

The electric fence and gates are to be constructed by the 2nd week of December 2011. Hand-over of the completed fence and gates to ZAPO will take place once the fence and gates are fully constructed, tested and commissioned and the electric fence and all gates are working in accordance with the specification detailed in this document

L7.1.6 Maintenance Contract

A maintenance contract will be entered into between ZAPO and the contractor's electric

fencing representative for the purpose of ensuring that the fence, gates and energizers are to be tested monthly by a skilled and authorized technician to ensure the integrity and effective operation of the installed equipment with signed-off physical hard copy reports of such testing provided to the representative of the security company within 24 hours of the tests being conducted.

As part of the maintenance contract, any malfunctioning component of the electric fence, gates or energizers are to be repaired or swapped out with replacement working equipment within 24 hours of a malfunction being reported by the designated ZAPO representative and repair completion reports submitted to the ZAPO representative within 1 (one) hour of repairs or swap-outs being effected.

L7.1.7 Pricing and Payment

The electric fence and gates supply, construction, installation, testing and commissioning contract is to be priced as a lump sum amount and to exclude the maintenance contract but include a separate item amount for each of the following as additional items that may be added to the contract: an additional swing gate, sliding gate, and double-leaf gate; energizer to be supplied, installed, tested and commissioned; an extra 100m of fencing (supply and construction of Bonnox fence and posts only) over and above the 2.2 km contract; an extra 100m of electric fencing only (supply and construction of electric fence only and excluding the Bonnox fence and posts) over and above the 2.2 km contract amount. A yearly price must also be provided for the maintenance of the fence, gates and energizers for the terms and conditions stipulated in the maintenance contract in section L7.1.6 above. Payment for the fence will be made on a certificate submission basis for work completed at intervals to suit the contractor's cash flow needs.

- **Penalties**

For every fortnight after the due date of completion that the electric fence remains incomplete, a penalty of 5% of the contract's total value will be deducted from payments still due to the contractor as at 28 February 2011.

- **Retention**

A retention amount of 5% of the total value of the contract will be retained by ZAPO for a period of 6 months after hand-over of the fence to ZAPO on completion and commissioning of the fence. This retention amount will be provided in full to the contractor at the end of the contract, less any additional expenditure amounts incurred by ZAPO in completing work needed for completion of the contract and which the contractor did not complete as part of the contract.

- **Breach**

In the event of the conditions of the construction, operation or maintenance of the electric fence not being met, ZAPO will inform the contractor in writing of a breach of the applicable conditions for which the contractor will have 7 (seven) days to rectify such a breach, failing which ZAPO will inform the contractor of the intention to cancel the contract and award the remaining outstanding requirements of the contract to another 3rd party contractor. Any outstanding payments due to the contractor in the event of the cancellation of the contract will be settled only once all the expenses incurred by ZAPO in employing the services of another contractor have been taken into

account. At the time of cancellation of the contract any completed work on site will be left "voetstoets" and not tampered with by the contractor in any way and any materials brought to site will remain on site until ZAPO has indicated in writing what may be removed off site.

- **Disputes**

In the event of a dispute arising from any aspect of the contract and which cannot be resolved, whether directly or indirectly, the parties must refer the dispute for resolution firstly by way of negotiation and in the event of that failing, by way of mediation and in the event of that failing, by way of Arbitration. The reference to negotiation and mediation is a precondition to the Parties having the dispute resolved by arbitration.

- (i) A dispute within the meaning of this clause exists once one Party notifies the other in writing of the nature of the dispute and requires the resolution of the dispute in terms of this clause.
- (ii) Within 7 (seven) calendar days following such notification, the Parties shall seek an amicable resolution to such dispute by referring such dispute to designated representatives of each of the Parties for their negotiation and resolution of the dispute. The representatives shall be authorised to resolve the dispute.
- (iii) In the event of the negotiation between the designated representatives not resulting in an agreement signed by the Parties resolving the dispute within 7 (seven) calendar days thereafter, the Parties must refer the dispute for resolution by way of mediation in accordance with the then current rules of the Arbitration Foundation of Southern Africa ("AFSA"). The periods for negotiation or mediation may be shortened or lengthened by written agreement between the parties.
- (iv) Each Party agrees that the Arbitration will be held as an expedited arbitration in Cape Town in accordance with the then current rules for expedited arbitration of AFSA by 1 (one) arbitrator appointed by agreement between the Parties, including any appeal against the arbitrator's decision. If the Parties cannot agree on the arbitrator or appeal arbitrators within a period of 7 (seven) calendar days after the referral of the dispute to arbitration, the arbitrator and appeal arbitrators shall be appointed by the Secretariat of AFSA. The references to AFSA shall include its successor or body nominated in writing by it in its stead.
- (v) The provisions of this clause 1 shall not preclude any Party from access to an appropriate court of law for interim relief in respect of urgent matters by way of an interdict, or *mandamus* pending finalisation of this dispute resolution process for which purpose the Parties irrevocably submit to the jurisdiction of a division of the High Court of the Republic of South Africa.

- **Insurance and Indemnity**

It is the contractor's responsibility to ensure that he has adequate insurance cover against injury or death of their workers, representatives, sub contractors and any other person brought onto site at the contractor's request for the purpose of construction, operation and maintenance of the electric fence, gates, energizers and any other components, including all tools, equipment, materials and excavations required for the

installation of the electric fence. The contractor will also ensure that he has sufficient 3rd party insurance for injury or death of any person coming into contact with the electric fence and its materials, tools, excavations and workers at any time during the construction, testing, commissioning and operation of the electric fence, gates, energizers and all other components related to the electric fence up until the hand-over of the fence to ZAPO. The contractor indemnifies ZAPO against any claims arising from any loss incurred by the contractor whatsoever during the construction, testing and commissioning of the fence and during the operation of the fence subsequent to its construction.

General

Tenderers may provide any additional details on the construction, operation or maintenance of the fence, gates and associated electrification and access control equipment that they deem would provide for the enhanced quality and/or security of the ZAPO fence.

L7.1.8 Location of fence and distances

NB. These are approximate distances and are subject to measurement on site by the tenderer. An extra 200m of fence may be required on the lower northern boundary depending on whether the owners of the SHORA property will permit their fence (currently being constructed) to be electrified by ZAPO. Pricing per 100m of extra fence is already catered for in the tender document.

South boundary:

From Steenberg Vineyards North/South electrified fence to a point about 4m West of the corner of erf 6971 160m

West boundary:

From the corner point described above to the top reservoir 130m

Around the reservoir South 20m

Around the reservoir West 20m

Around the reservoir North 25m

Along the Western boundary to corner reservoir 240m

Around the corner reservoir South 60m

Around the corner reservoir West 50m

Around the corner reservoir North 55m

Along the 4 metre strip to the big rock 415m

North Boundary:

From big rock to Noli stables 425m

Noli stables to Zwaanswyk Gate 330m

Zwaanswyk Close gate to new ex-SHORA property palisade fence 250m

Across road verge from ex-SHORA property palisade fence line 20m

Total: 2200m

18 REFERENCES

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