

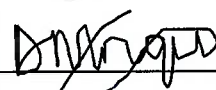



Specification Template

| SPECIFICATION FOR THE DESIGN AND CONSTRUCTION OF A SMART SECURITY FENCE AT THE SWARTKOPS LOCOMOTIVE DEPOT | | | | |
|---|---|------------------------|--|---------------|
| | Name | Designation | Signature | Date |
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| Approved By | Neil Naidu | Executive Manager |  | 25 March 2025 |
| Location: | Swartkops Locomotive Depot, John Tallant Road, Deal Part , Gqeberha ,6210 | | | |

1. INTRODUCTION

The purpose of this specification is to outline the design, supply, and construction requirements for a **ClearVu Security Fence** or similar approved in full compliance with the specification requirements at the **Swartkops Locomotive Depot**. The fence shall be reinforced with a **30-strand Piggyback electric fence** and supported by an **intrusion detection system** comprising of **Pan, Tilt and Zoom (PTZ) cameras, motion-detecting CCTV cameras, horn alarms, and a security communication system**.

The total perimeter of the depot is approximately **3 kilometers**, and provisions must be made for two variations (Award of which will be based on budget Availability):

1. A **full-length 30-strand Piggyback electric fence** along the entire 3 km perimeter.
2. A **50% Piggyback electric fence**, covering only 1.5 km of perimeter.

All hardware, including monitoring equipment, power supply, and viewing screens, must be included.



Figure 1: Swartkops Locomotive Maintenance Depot Overview

2. SCOPE OF WORK SUMMARY

The project involves the following key activities:

2.1. Design and Supply of ClearVu/Similar Approved Security Fence

- A **high-security ClearVu fence** or similar approved shall be installed along the **3 km perimeter**.

- The fence shall be constructed from **high-tensile welded mesh panels**.
- **Finish:** Powder-coated in **RAL 9005 (Black)** for corrosion resistance.
- **Impact Resistance:** Designed to withstand **mechanical impact forces exceeding 500 Joules**
- The fence height shall be a minimum of **2.4 meters**.
- Panel Requirements: Width – 3000mm, Aperture 12.7mmx76mm , Wire Diameter 4mmx3mm
- Posts shall be installed at **maximum 3-meter intervals** and supplied and installed with the appropriate base.
- Shall be installed with Top Mount Spikes (Thermal Marine Bond-Black)
- Security Gates: Supply and installation of pedestrian access gates and vehicle access gates (truck-compatible).
- Allowance shall be made for the removal of the existing fence structure for installation of the above.

2.2. Installation of Piggyback Electric Fence

- The **30-strand electric fence** shall be installed behind the Security fence.
- Fence monitoring software must provide PC based visual interaction with your electric fence system. Visual map images of the electric fence and its zones must be displayed on a computer screen. This software must allow for remote monitoring and control features. An audit trail or transaction logs are to be recorded on the operational history of the system over time.
- The fence shall be divided into monitored **zones** to ensure localized alarm triggers.
- The electric fence must be **SANS 10222-3** compliant.

2.3. Intrusion Detection and Surveillance System

- Installation of **PTZ and fixed CCTV cameras** at strategic intervals along the fence with minimum 900m visuals. This shall be pole mounted at a minimum of 6m.

- PTZs shall only be allowed for the area of the depot adjacent to Kwazakele Informal Settlement.
- Cameras must have **motion detection capabilities** to notify security of any perimeter breaches before they occur with the location accuracy required to be 2.5m or less.
- Security personnel must be able to view live footage on **multiple monitoring screens** at the security control room.
- **Alarm horns** shall be installed along the fence to warn intruders upon detection.
- Security personnel must be able to **communicate via loudspeakers** to deter intruders.
- Each Pole shall be provided with Self Sustaining Power (Each Pole to have standalone system) – Solar Powered with Lithium Ion Battery (12.8V , 100ah, 1280Wh , Grade 1 , with minimum 6000 Cycles at 80% DOD. This shall be supplied and installed with all ancillary components
- Allowance shall be made for a Failover – Onboard Storage of CCTV with minimum 256GB capacity.

2.4. Power and Connectivity

- Power supply to the fence and surveillance system must be **uninterrupted**.
- Backup power (battery and/or generator) must be supplied.
- Network connectivity for remote viewing and monitoring must be established.
- All electrical work shall be accompanied by an electrical Certificate of Compliance where applicable.
- Surge Protection shall be allowed for.

2.5. Testing and Commissioning

- System functionality testing shall be conducted.
- Training sessions for security personnel shall be provided.
- Full handover documentation, including **as-built drawings**, warranties, and maintenance manuals.

3. SOUTH AFRICAN STANDARDS AND LEGISLATION TO COMPLY TO:

- **SANS 10222-3** – Electric security fences

- **SANS 1063** – Welded mesh fencing
- **SANS 10313** – Protection against lightning
- **SANS 10142** – Electrical installations
- **SANS 10400** – Structural design and construction
- **SANS 62676** – CCTV surveillance system requirements
- **SANS 60068** – Environmental testing of equipment
- **OHS ACT 85 of 1993:** Occupational Health and Safety Act
- **National Railway Safety Regulator Act 16 of 2002 :** Railway Safety Regulator Specific Compliance Requirements.

4. MATERIAL AND TECHNICAL SPECIFICATIONS

4.1. ClearVu Fence or similar approved

- **Material:** High-tensile steel, anti-cut and anti-climb mesh
- **Height:** 2.4 meters minimum
- **Coating:** Galvanized and powder-coated for corrosion resistance
- **Posts:** Square hollow steel, installed at max 3m intervals

4.2. Piggyback Electric Fence

- **Strands:** 30 high-voltage strands
- **Zoning:** Monitored in 250m sections
- **Compliance:** SANS 10222-3
- Built-in alarm monitors tampering or faults on the high voltage and earth fence wires.
- Connectable to armed response radio or GSM module.
- Lightning and power surge protection
- Easy-to-use tag included for controlling the energizer.
- Optional keypad for controlling and programming the energizer. This allows the user to control the energizer remotely, with up to four keypads.
- Powered by 240V mains and includes built-in battery for back-up power

4.3. Intrusion Detection System

- **PTZ Cameras:** 360-degree rotation, night vision, 4K resolution, thermal and motion detection, IP Rated for external use
- **Fixed CCTV Cameras:** Motion detection, night vision, IP-rated for external use.
- **Alarm Horns:** Weatherproof, minimum 120 dB output
- **Control Room Equipment:** High Performance I7 QuadView Display Operator Work station with 16GB DD4 Ram , 1TB 3.5" 7200rpm. (To include Wireless Mouse and Keyboard). 2 x 32" HD ready Displays
- **Speaker System:** Two-way communication from security base station

4.4. Pedestrian Gates

- **Height:** 2.4 meters.
- **Width:** 1.2 meters.
- **Construction:** ClearVu mesh with reinforced steel frame.
- **Anti-tamper:** Locking mechanisms shall be provided with anti-tamper facilities.

4.5. Vehicle Gates

- **Height:** 2.4 meters.
- **Width:** Sliding Gates for the Main Entrance and Swing Gates where the trains exit and enter the depot. with Minimum width of 5 Meters
- **Operation:** Motorized operation with remote control and manual override.
- **Anti-tamper:** Locking mechanisms shall be provided with anti-tamper facilities.
- The sliding gates shall be fitted with anti-lifting devices to prevent lifting off the rails.

7. WARRANTY & MAINTENANCE

- **Minimum 12-month warranty** on all hardware.
- ClearVu/Similar approved material shall have a minimum warranty of 5 Years on corrosion protection and structural soundness.
- The fence should be maintenance free during this period.

8. SITE ESTABLISHMENT

- The contractor shall solely be responsible for the safety of their staff and providing security to safeguard the work and material on site.
- The contractor shall also be liable for any damage to site caused by the setting of the site camp and during the execution works caused by their staff.